INSECTS OF MICRONESIA
HYMENOPTERA

Chalcidoidea: Eulophidae, Encyrtidae (part), Pteromalidae[1]

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INTRODUCTION

This report is on three families of Chalcidoidea: Eulophidae, Encyrtidae (Eupelminae only), and Pteromalidae. Of a total of 71 species in 32 genera represented from Micronesia, 39 species and 1 genus are described as new. The specimens were collected by P. A. Adams, J. W. Beardsley, G. E. Bohart, E. H. Bryan, Jr., C. F. Clagg, R. L. Doutt, H. S. Dybas, E. J. Ford, Jr., D. T. Fullaway, R. J. Goss, J. L. Gressitt, N. L. H. Krauss, K. L. Maehler, W. C. Mitchell, R. G. Oakley, C. W. Sabrosky, F. M. Snyder, O. H. Swezey, H. K. Townes, and R. L. Usinger.

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[1] This represents, in part, Results of Professor T. Esaki's Micronesian Expeditions (1936-1940), No. 125.

[2] Dr. Ishii was unable to make more than preliminary notes for this paper before his death. The great part of the manuscript is the work of C. M. Yoshimoto who undertook the task of preparing the paper for publication.—Editor.

Distribution of Micronesian Chalcidoidea

	Micronesian Island Groups											
				Caroline								
	Bonin	N. Mariana	S. Mariana	Palau	Yap	Caroline Atolls	Truk	Ponape	Kusaie	Marshall	Gilbert	Other Localities
Eulophidae												
Eulophinae												
1. Asympiesiella india			×									India, Ceylon, Philippines, Indonesia
2. Sympiesis swezeyi*			G†		×					×		
3. Hemiptarsenus semialbiclavus			×			×				×		Australia, Hawaii, Philippines
4. H. carolinensis*						×				×	×	
Tetrastichinae												
5. Tetrastichus hagenowii			G	×	×	×	×	×				Worldwide
6. T. kraussi*				×								
7. T. palauensis*				×								
8. T. luteorubidus*				×			×	×				
9. T. boninensis*		×										
10. T. yapensis*					×							
11. T. guamensis*			G									
12. T. burrus*						×	×	×				
13. T. gressitti*						×	×	×				
14. T. brontispae			×									Java, New Guinea
15. Melittobia hawaiiensis			G					×				Hawaii, Wake
16. Melittobiopsis ereunetiphila			×									Hawaii, Indonesia
17. Ootetrastichus beatus			×	×								Hawaii, Australia, Fiji
18. O. formosanus			G	×	×	×		×				Hawaii, Taiwan
19. Paratetrastichus burksi*								×				
Elachertinae												
20. Euplectrus xanthocephalus			G		×							Australia
21. E. leucostomus			G									
22. E. advena			G	×		×		×	×		×	Hawaii, Midway
23. E. nigricoxatus*				×	×							
24. E. ponapensis*								×				
25. Entedonomorpha guamensis			G		×	×		×				
26. Cirrospiloideus kraussi*						×		×		×		
27. C. fullawayi*										×		
28. C. guamensis			G									
29. C. japonica			G	×		×						Japan
Entedontinae												
30. Closterocerus sp.				×								
31. Euderus beardsleyi*				×								
32. E. yapensis*					×							
33. E. metallicus				×	×	×						Hawaii
34. Burksia viridimaculata				×								Hawaii, Florida
35. Derostenus fullawayi				×								Hawaii, United States, Canada

* Described as new.
† Guam only.

Distribution of Micronesian Chalcidoidea

	Micronesian Island Groups											Other Localities
				Caroline								
	Bonin	N. Mariana	S. Mariana	Palau	Yap	Caroline Atolls	Truk	Ponape	Kusaie	Marshall	Gilbert	
Encyrtidae												
Eupelminae												
36. Zaischnopsis usingeri				×								
37. Eusandalum usingeri*			G									
38. Metapelma palauensis*				×								
39. Eupelmus popa		×	×									United States, Hawaii, West Indies, India
40. E. aeneus*			G					×				
41. E. nigricoxus*			G									
42. E. microreticulatus*			G									
43. E. carolinensis*				×								
44. E. guamensis*			G									
45. E. viridiceps*				×	×			×				
46. E. kororensis*				×								
47. E. boharti*		×										
48. Anastatus kraussi*			G									
49. A. crassipes*				×								
50. A. adamsi*					×			×				
51. A. picticornis			G									
52. Merostenus guamensis*			G									
53. M. palauensis*				×								
54. M. ferrugineus*			G									
Pteromalidae												
Spalangiinae												
55. Spalangia cameroni			G									Hawaii, Fiji
56. S. nigra			G									Australia, New Zealand, Europe, North America, Peru, India
57. S. endius			G					×				Hawaii, Philippines
Diparinae												
58. Dipara palauensis*				×			×					
Miscogasterinae												
59. Sphegigaster burksi*								×				
60. S. rugosa						×						Philippines, India, Ceylon, Indonesia
61. S. trukensis*				×	×		×					
62. S. yapensis*					×							
Pteromalinae												
63. Moranila californica			×	×			×					California, Mexico, Australia, Hawaii, Europe, Wake
64. Merisus sp.			G									
65. Paruriella sp.	×		G									
66. Eupteromalus americanus	×		G									United States, Russia, Europe
67. Norbanus nigriceps*				×	×		×					
68. N. elongastus*				×	×	×						
69. Pteromalus puparum	×				×							United States, Hawaii, Europe, N. Africa, New Zealand, China
70. Habrocytus medicaginis			G					×				Hawaii, United States, Russia
71. Ptinobius swezeyi*			G	×								

The following symbols indicate the institutions in which specimens are stored: US (United States National Museum), BISHOP (B. P. Bishop Museum), KU (Kyushu University), CM (Chicago Natural History Museum), MCZ (Museum of Comparative Zoology).

We are deeply indebted to Dr. B. D. Burks, Insect Identification and Parasite Introduction Research Branch, United States Department of Agriculture, for his help in examining the specimens of the families Eulophidae, Encyrtidae, and Pteromalidae and for his valuable comments and criticism of the manuscript. Drawings are by T. Nagatani and Barbara Downs.

SYSTEMATICS

Family EULOPHIDAE

Among the Micronesian Chalcidoidea, the family Eulophidae is numerically best represented. There are four subfamilies, Eulophinae (4 species), Tetrastichinae (15 species), Elachertinae (10 species), and Entedoninae (6 species) in Micronesia. These subfamilies include 15 genera and 35 species, of which one genus and 17 species are described as new.

Of the Micronesian Eulophidae, a total of 9 out of 15 genera are worldwide in distribution and three genera show special Australia-New Guinea affinities. The members of this group have spread across the central Pacific area and eastward as far as Hawaii, Fiji, or elsewhere. The distribution of these wasps may be related to air dispersion or accidental introduction by man to the Micronesian islands, and an island to island air hop is highly probable. However, these tiny wasps may have less chance of being air borne from Hawaii to the continental United States to become established there, and competition in continental environments may reduce chances of establishment. On the other hand, large numbers of species have been distributed in an east to west direction through release of parasitic wasps for biological control purposes, particularly on Guam.

These parasitic wasps are diverse in their habits and host selection. Many of the species of this group are economically important. Eulophinae are principally external parasites of leaf-mining dipterous, lepidopterous, and hymenopterous larvae; others are known to be hyperparasites.

The Tetrastichinae are primary parasites of immature insects of many orders. Other members of this group are known to be parasites or predators on eggs. The Elachertinae are usually external parasites of lepidopterous larvae. And the members of the subfamily Entedontinae are internal parasites of dipterous, coleopterous, and lepidopterous larvae.

Members of this family are distinguished from those of other families of Chalcidoidea by the 4-segmented tarsi (females 5-segmented or heteromerous in one or two genera), spur of frontal tibia usually weak, and axillae extending obliquely forward at the sides.

Key to Subfamilies of Micronesian Eulophidae

1. Submarginal vein of fore wing broken proximal to marginal vein, usually shorter than marginal, stigmal vein rarely long, postmarginal vein nearly always absent or slightly developed, rarely equal to or longer than stigmal or radial 2
   Submarginal vein of fore wing not broken before uniting with marginal vein, usually equal to or longer than marginal, stigmal rarely short, postmarginal vein always present, usually equal to or longer than stigmal or radial 3
2. Postmarginal vein present; abdomen often petiolate........ **Entedoninae**
   Postmarginal vein absent; abdomen usually sessile, rarely petiolate........ **Tetrastichinae**
3. Parapsidal furrows complete, entire, distinct; abdomen frequently petiolate........ **Elachertinae**
   Parapsidal furrows wanting or incomplete; abdomen usually sessile........ **Eulophinae**

Subfamily EULOPHINAE

Key to Genera of Micronesian Eulophinae

1. Hind tibiae with two apical spurs; antennal flagellum somewhat flattened........ **Sympiesis**
   Hind tibiae with one apical spur........ 2
2. Antenna inserted at middle of face........ **Hemiptarsenus**
   Antenna inserted below middle of face........ **Asympiesiella**

Genus **Asympiesiella** Girault

Asympiesiella Girault, 1913, Queensland Mus., Mem. **2**: 285 (type: *Sympiesis nelsonensis* Girault. Designated by Girault, 1913).

1. Asympiesiella india Girault.

Asympiesiella india Girault, 1916, Canadian Ent. **48**: 341.—Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 217.

DISTRIBUTION: Ceylon, Philippine Is., Indonesia, S. Mariana Is., India.

S. MARIANA IS. Guam: Female, Dededo, Aug. 1936, ex leaf roller, Swezey; female, Barrigada, July 1936, ex leaf miner, Swezey.

Genus **Sympiesis** Foerster

Sympiesis Foerster 1856, Hym. Stud. **2**: 74, 76 (type: *Eulophus sericeicornis* Nees, original designation).—Peck, 1963, Canadian Ent., Suppl. **30**: 90-99.

2. Sympiesis swezeyi Yoshimoto and Ishii, n. sp.

Female: Black with greenish reflection except basal half of abdomen pale yellowish red; antennae dark brown except scape yellowish and pedicel brown. Wings hyaline with veins pale yellowish brown; legs yellowish red.

Head almost as wide as deep; surface smoothly polished; frontovertex rather narrow; scrobes shallow. Ocelli in an obtuse-angled triangle; posterior pair separated

from inner eye margins by their own diameter and from occipital margin by one-half their own diameter.

Antennae 9-segmented; antennal scape cylindrical; one ring segment; pedicel twice as long as wide at apex; funicle segments cylindrical, slightly decreasing in length; segment 1 much longer than pedicel, about twice as long as wide and longer than other segments of funicle; club 3-segmented, a little wider and much longer than last funicle segment. Pronotum, mesonotum, and scutellum with shallow reticulation; scutellum nearly as broad as long; surface similar to mesonotum. Propodeum with a distinct median carina; sulci present along lateral margin.

Wings uniformly ciliate except basal part below submarginal vein; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 23: 23: 5: 11.

Abdomen ovate, a little shorter than thorax; ovipositor sheaths slightly produced.

Length of body 1.52 mm.

Male: Similar to female except as follows: Abdomen and antennae slightly darker, basal portion of coxae slightly dark in coloration. Antennae 9-segmented and triramose; scape short, wider than in female, pedicel wider and shorter than funicle segment 1; no definite ring segment present; funicle 4-segmented; sgment 1 shorter than 2 and segment 3 longer than 2; segment 4 slightly over twice as long as 3.

Abdomen narrower and shorter than female.

Length of body 1.5 mm.

Holotype, female (BISHOP 3564), Piti, Guam, Mariana Is., ex leaf miner, Nov. 9, 1936, Swezey. Allotype, male, Yap, Yap I., Gagil Dist., July-Aug. 1950, Goss. Paratypes (BISHOP, US): Female, same data as holotype, Swezey; three males, Gagil Dist., S. Map I., Yap group, July-Aug. 1950, Goss; two males, Giliman, Yap I., June 1957, Sabrosky. Female, Kwajalein I., Marshall Is., Feb. 19, 1958, Krauss.

DISTRIBUTION: S. Mariana Is. (Guam), Caroline Is. (Yap), Marshall Is. (Kwajalein).

Ashmead in his key to genera of Eulophini (1904), uses the following characters to separate *Dimmokia* from *Sympiesis*: ". . . flagellum more or less compressed, the joints long, the first joint of the funicle much the longest joint; metathoracic spiracles oblong-oval" for *Sympiesis* Foerster; ". . . flagellum not compressed, the funicle joints cylindrical; metathoracic spiracles minute, rounded; abdomen ovate or oval, depressed . . ." for *Dimmockia* Ashmead. These genera are closely related and they are difficult to differentiate. However, following our interpretation of *Sympiesis,* these two genera are here treated as separate entities until such time as they prove to be the same.

Genus **Hemiptarsenus** Westwood

Hemiptarsenus Westwood, 1833, Mag. Nat. Hist. **6**: 122 (type: *Hemiptarsenus fulvicollis* Westwood, designated by Westwood, 1840).—Peck, 1963, Canadian Ent., Suppl. **30**: 101.

3. **Hemiptarsenus semialbiclavus** (Girault).

Hemiptarsenoideus semialbiclava Girault, 1916, Queensland Mus., Mem. **5**: 220.—Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 216.

DISTRIBUTION: Australia, Philippines, Hawaii, S. Mariana Is., Caroline Is., Marshall Is.

S. MARIANA IS. GUAM: Nine females, 11 males, Piti, Aug. 1936, ex corn agromyzid, ex maggot of corn leaf miner, Swezey (eight, US); female, Orote Pt., May 1936, Swezey.

CAROLINE ATOLLS. PULO ANNA: Female, Sept. 1952, Krauss. ULITHI: Female, Mogmog I., Oct. 1952, Krauss.

MARSHALL IS. EBON: Female, Ebon I., Sept. 1953, Beardsley. ENIWETOK: Female, May 1946, Townes.

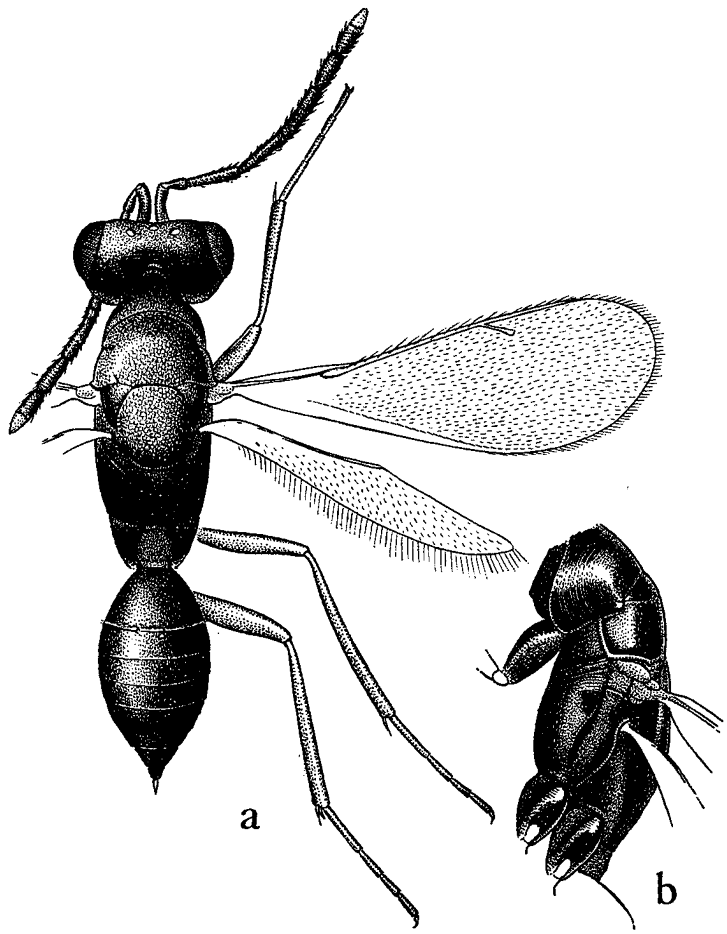


FIGURE 1.—*Hemiptarsenus carolinensis,* female: **a**, dorsal view; **b**, lateral view.

4. Hemiptarsenus carolinensis Yoshimoto and Ishii, n. sp. (fig. 1).

Female: Black with a metallic-green reflection. Antennae dark brown except scape reddish yellow, with brownish annellus near tip; apical two segments of club whitish.

Wings hyaline except base, veins pale brown; legs pale reddish yellow except coxae concolorous with body; distal three segments of tarsi pale brown.

Head, pronotum, and postscutellum shagreened; mesonotum and scutellum reticulate; propodeum smooth and shining with a median and a lateral carina, but median carina only indicated in basal portion. Abdomen smooth except for segments 5 and 6 which are shagreened.

Frontovertex broad; ocelli small, in a nearly straight line; posterior pair separated from inner eye margins by about three times their own diameter and from occipital margin; antennal scrobes rather deep. Antennae rather long; scape subcylindrical; pedicel twice as long as wide at apex; funicle segments cylindrical, subequal in length and width, but segment 4 a little shorter; club slightly longer than preceding segment, segments subequal in length.

Anterior margin of pronotum not as acute as in preceding species; abdomen as long as thorax, ovate and flat above; ovipositor not extruded.

Wings uniformly ciliate except at base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 18: 18: 9: 5.

Length of body 1.28 mm.

Holotype, female (US 67516), Falalis I., Woleai Atoll, Caroline Is., Sept. 20, 1952, Krauss. Paratypes (BISHOP, US): Female, same as holotype. Yap, two females, Kolonia, Apr. 1954, Beardsley. Caroline Atolls: Woleai, female, Utagal I., Feb. 1953, Beardsley. Ulithi, female, Potangeras I., Nov. 10, 1947, Dybas. Marshall Is.: Ebon, female, Ebon I., Sept. 1953, Beardsley. Gilbert Is.: Marakei, female, Dec. 1957, Krauss; Tarawa, two females, Bairiki I., Nov. 1957, Krauss, female, Eret I., Dec. 1957, Krauss, female, Marenanuka I., Dec. 1957, Krauss, female, Teaoraereke I., Nov. 1958, Krauss; Butaritari, four females, Butaritari I., Dec. 1957, Krauss.

DISTRIBUTION: Caroline Is. (Yap), Caroline Atolls (Woleai, Ulithi), Marshall Is. (Ebon), Gilbert Is. (Marakei, Tarawa, Butaritari).

Subfamily TETRASTICHINAE

Key to Genera of Micronesian Tetrastichinae

1. Mesonotum with a median groove .... **Tetrastichus**
   Mesonotum without a median groove 2
2. Funicle of antennae 2-segmented .... **Melittobiopsis**
   Funicle of antennae 3- or 4-segmented 3
3. Antennae with four ring segments .... **Ootetrastichus**
   Antennae with one or three ring segments 4
4. Antennae with one ring segment 5
   Antennae with three ring segments .... **Paratetrastichus**
5. Pronotum long, conical; male antennal scape not enlarged .... **Melittobia**
   Pronotum transverse; male antennal scape greatly enlarged .... **Tetrastichus**

Genus **Tetrastichus** Haliday (nec Walker)

Tetrastichus Haliday, 1843, Ent. Soc. London, Trans. **3**: 297 (preoccupied by *Tetrastichus* Walker, 1842, Ann. Mag. Nat. Hist. **10**: 116; type: *Cirrospilus attalus* Walker; monobasic).—Peck, 1963, Canadian Ent., Suppl. **30**: 120-156.

KEY TO SPECIES OF MICRONESIAN TETRASTICHUS

1. Body brownish to fuscous with greenish tint, or testaceous 2
   Body bluish black with greenish tint 7
2. Antennal scape not reaching anterior ocellus 3
   Antennal scape reaching anterior ocellus 5
3. Furrows on scutellum distinct; propodeum smooth; body yellowish with reddish-brown markings 4
   Furrows on scutellum indistinct; propodeum punctate-rugose; body dark brown to blackish .... **14. brontispae**
4. Meso-metanotum with dark-brown marking; female with entire ovipositor sheath black .... **11. guamensis**
   Meso-metanotum without a dark marking; female with only apical portion of ovipositor sheath black .... **12. burrus**
5. Third funicle segment stubby, short and broad 6
   Third funicle segment normal, narrow and long .... **6. kraussi**
6. Prepectus yellowish .... **13. gressitti**
   Prepectus brownish to fuscous .... **7. palauensis**
7. Cilia on apical margin of fore wing short or pubescent 8
   Cilia on apical margin of forewing long and distinct 9
8. Base of tergite 2 yellowish .... **5. hagenowii**
   Base of tergite 2 brownish to fuscous .... **9. boninensis**
9. Mesonotum rugulose, hind coxae testaceous, abdomen entirely fuscous .... **10. yapensis**
   Mesonotum polished, a few places light rugulose, hind coxae brownish, basal portion of abdomen testaceous .... **8. lutorubidus**

5. Tetrastichus hagenowii (Ratzeburg).

Entedon Hagenowii Ratzeburg, 1852, Ichneumonen der Forstinsecten **3**: 211.

Tetrastichus hagenowii: Fullaway, 1913, Hawaiian Ent. Soc., Proc. **2**: 287. —Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 217.—Peck, 1963, Canadian Ent., Suppl. **30**: 135.

DISTRIBUTION: Probably worldwide, S. Mariana Is., Caroline Is.

S. MARIANA IS. GUAM: 10 females, Fullaway; female, Merizo, Oct. 1936, Swezey.

PALAU. BABELTHUAP: Female, Ngerchelong, Dec. 1947, Dybas. ULEBSEHEL: Three males, Auluptagel I., Sept. 1952, Krauss.

YAP. YAP: Female, July-Aug. 1950, Goss.

CAROLINE ATOLLS. SATAWAL: Satawal I., female, Feb. 1953, Beardsley.

TRUK. WENA (Moen): Female, Oct. 1952, Beardsley.

PONAPE. Female, Mt. Temwetemwensekir, 312-470 m., Feb. 1948, Dybas.

T. hagenowii is known to parasitize the egg cases of Blattidae (Roth and Willis, 1960, Smithsonian Misc. Coll. **41**: 250-251).

6. Tetrastichus kraussi Yoshimoto and Ishii, n. sp. (fig. 2).

Female: Black with metallic-green reflection; abdomen brownish black; antennae dark brown except scape and pedicel yellowish red. Wings hyaline with veins pale brown. Legs, excluding coxae, yellowish red.

Head and pronotum minutely shagreened; mesoscutum and scutellum minutely, longitudinally scaly reticulate; propodeum with a median carina, very minutely shagreened. Abdomen also very minutely shagreened.

Head wider than thorax, narrowed anteroposteriorly and a little narrower than deep; scrobes rather deep. Ocelli in an arc, posterior pair separated from inner eye margins by twice their own diameter and from occipital margin by their own diame-

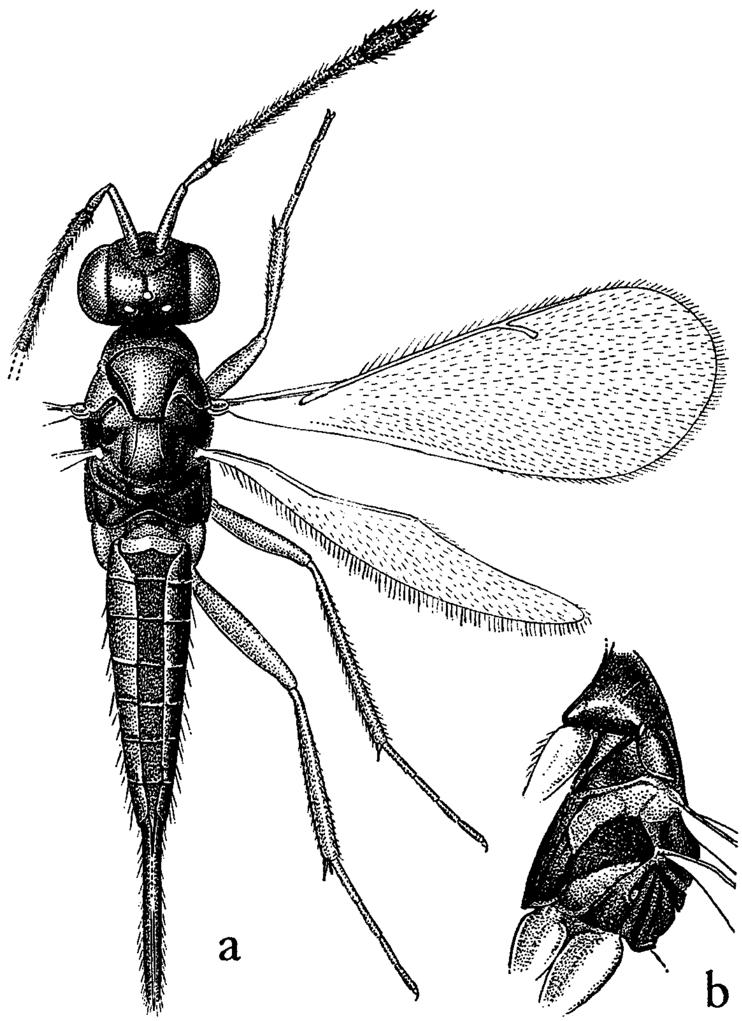


FIGURE 2.—*Tetrastichus kraussi,* female: **a,** dorsal view; **b,** lateral view.

ter. Antennae rather long; scape subcylindrical; pedicel twice as long as wide at apex; funicle segment 1 about twice as long as pedicel and about five times as long as wide; funicle segment 2 a little shorter than 1; segment 4 a little shorter than 3; club considerably wider than last funicle segment and a little shorter than last two funicle

segments combined. Wings uniformly ciliate except at extreme base. Abdomen much longer than head and thorax combined and lanceolate toward tip; segments subequal in length. Pygidium plow-shaped; ovipositor sheaths long, about three-fourths length of abdomen.

Length of body 1.4 mm.

Male: Black with a metallic-green reflection, but more feeble than in female. Antennae rather long; scape considerably dilated; pedicel twice as long as wide at apex; funicle segment 1 long, cylindrical, nearly twice as long as pedicel and nearly four times as long as wide; funicle segment 2 as long as segment 1; segments 3 and 4 subequal, a little shorter than 2; segment 5 considerably shorter than 4; club with a nipple at apex, as wide as last funicle segment and nearly twice as long as last two segments combined; abdomen nearly as long as thorax; other characters as in female.

Length of body 0.96 mm.

Holotype, female (US 67517), allotype, male (US), Auluptagel, Palau I., Sept. 1952, Krauss. Paratypes: Female, Auluptagel, Palau, Dec. 19, 1952, Beardsley; female, Babelthuap, Ngaremeskan, 30 m., Dec. 24, 1952, Gressitt.

DISTRIBUTION: Caroline Is. (Palau).

7. **Tetrastichus palauensis** Yoshimoto and Ishii, n. sp. (fig. 3).

Female: Black with a metallic-green reflection, but abdomen with a feeble reflection. Antennae brown except scape and pedicel reddish brown. Wings hyaline with veins pale brown; tegulae reddish brown. Legs reddish yellow except hind coxae black.

Head and pronotum minutely scaly reticulate; mesoscutum and scutellum finely shagreened, appearing like longitudinal minute striations; furrows on scutellum distinct; propodeum minutely shagreened and with a median carina. Abdomen also minutely shagreened.

Head little wider than thorax, narrowed anteroposteriorly; scrobes rather deep; frontovertex broad; ocelli in an arc, posterior pair separated from the inner eye margins by their own diameter and from occipital margin by one-half their own diameter. Antennae rather long; scape subcylindrical; pedicel little more than twice as long as wide at apex; funicle segment 1 about twice as long as pedicel and four times as long as wide; following segments gradually decreasing in length distad; club slightly wider than last funicle segment and a little shorter than last two funicle segments combined.

Wings uniformly ciliate except at base. Abdomen conic-ovate, a little shorter than head and thorax combined and segments subequal in length. Ovipositor sheaths moderately long, about one-third length of abdomen.

Length of body 1.12 mm.

Holotype, female (US 67518), two paratype females, Auluptagel I., Palau, Sept. 1952, Krauss.

DISTRIBUTION: Caroline Is. (Palau).

This species is closely allied to *T. kraussi* n. sp., but it may be distinguished by the much shorter ovipositor sheaths and the black hind coxae.

8. **Tetrastichus luteorubidus** Yoshimoto and Ishii, n. sp.

Female: Black with strong metallic-green reflection except the basal half of abdomen reddish yellow. Antennae dark brown except scape and pedicel yellowish red; tegulae yellowish red; wings hyaline with veins pale brown; legs reddish except hind coxae concolorous with body.

Head a little wider than deep; scrobes rather deep; ocelli in an obtuse-angled triangle, posterior pair separated from inner eye margins by twice their own diameter and

from occipital margin by their own diameter. Antennae rather short; scape cylindrical; pedicel twice as long as wide at apex; funicle segment subequal in length and width, slender and with sparse hairs; funicle segment 1 a little shorter than preceding two funicle segments combined.

Fore wings and hind wings rather narrow, uniformly ciliate except at extreme base. Abdomen conic-ovate, a little longer than thorax; ovipositor sheaths one-third length of abdomen.

Length of body, 1.80-1.90 mm.

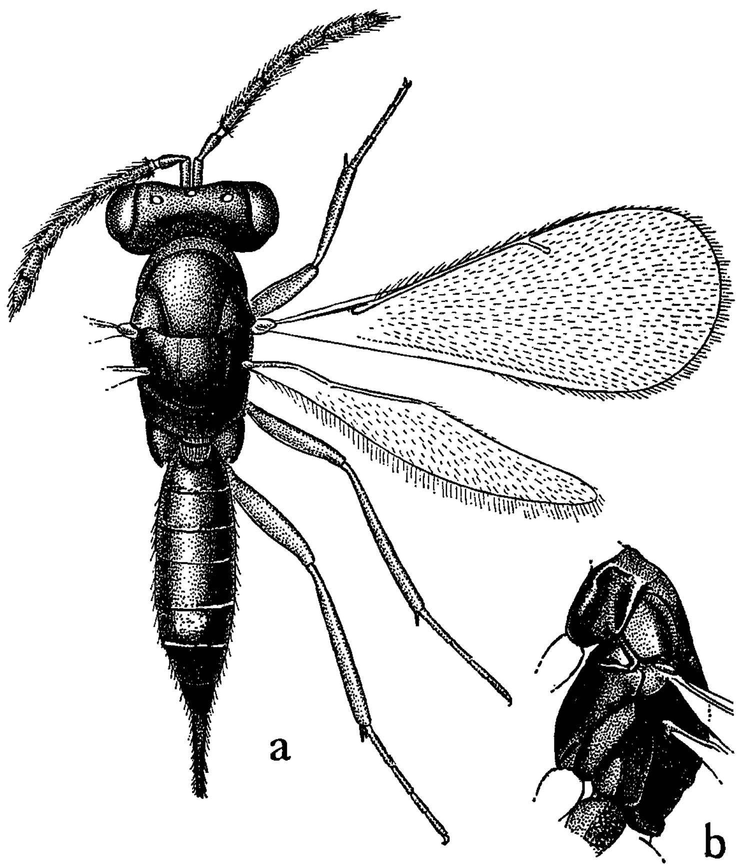


FIGURE 3.—*Tetrastichus palauensis,* female: **a,** dorsal view; **b,** lateral view.

Holotype, female (BISHOP 3565), Mt. Iron, Fefan I., Truk, Jan. 31, 1953, Gressitt. Paratypes: Female, Malakal I., Palau, Sept. 1952, Krauss; Babelthuap I., female, E. Ngatpang, 65 m., light trap, Dec. 1952, Gressitt. Yap, Yap I., hill behind Yaptown, Dec. 1958, Gressitt. Ponape, female, airfield no. 2, June-Sept. 1950, Adams.

DISTRIBUTION: Caroline Is. (Palau, Yap, Truk, Ponape).

9. **Tetrastichus boninensis** Yoshimoto and Ishii, n. sp.

Female: Black with a metallic-blue reflection; antennae dark brown except scape reddish brown. Wings hyaline with veins pale brown; tegulae pale brown; legs yellowish red except fore and hind coxae black.

Head and pronotum reticulate; mesoscutum and scutellum scaly strio-reticulate, mesoscutum with a distinct median furrow and scutellum with two pairs of furrows; pleura and abdomen shagreened; propodeum moderately reticulate with median and lateral carinae.

Head a little wider than deep; scrobes shallow; frontovertex broad; ocelli in an obtuse-angled triangle, posterior pair separated from inner eye margins by three times their own diameter and from occipital margin (which is not distinct) by about the same.

Antennal scape cylindrical; pedicel a little longer than wide at apex; funicle segments cylindrical, longer than wide and gradually decreasing in length distad; segment 1 twice as long as wide and much longer than pedicel; club as wide and as long as last funicle segment.

Fore wings uniformly ciliate except very sparsely at base; hind wings also ciliate except at base.

Abdomen long and pointed toward tip, much longer than head and thorax combined; segments subequal in length; ovipositor very short, about one-tenth length of abdomen.

Length of body 1.9 mm.

Holotype, female (KU), Chichi Jima, Miyanohama, Bonin I., July 1, 1936, Ikeda.

DISTRIBUTION: Bonin Is. (Chichi Jima).

10. **Tetrastichus yapensis** Yoshimoto and Ishii, n. sp.

Female: Black with a metallic-green reflection; abdomen dark brown; antennae dark brown except scape; scape and legs reddish yellow; basal part of venter of abdomen reddish yellow. Wings hyaline with veins pale brown.

Head, pronotum, mesonotum, and pleura shagreened; areas between median and lateral carinae of propodeum reticulate. Abdomen minutely shagreened.

Head wider than deep; scrobes shallow; frontovertex broad; ocelli in an arc, posterior pair separated from inner eye margins by their own diameter and from occipital margin by a little less than their own diameter. Antennae: Scape cylindrical; pedicel a little more than twice as long as wide at apex; funicle segment 1 almost as long as pedicel and a little more than twice as long as wide; segment 2 slightly shorter than 1; 3 much shorter than 2; club slightly wider than last funicle segment and as long as last two funicle segments combined.

Fore wings and hind wings uniformly ciliate except basal part just below submarginal vein sparsely ciliated.

Abdomen as long as head and thorax combined, conic-ovate and pointed toward tip; segments subequal in length, first longest; ovipositor sheaths short, about one-fifteenth length of abdomen.

Length of body 1.2 mm.

Holotype, female (US 67519), Yap I., Caroline Is., Oct. 1952, Krauss.

DISTRIBUTION: Caroline Is. (Yap).

This species is somewhat allied to *T. colemani* Crawford described from India.

11. Tetrastichus guamensis Yoshimoto and Ishii, n. sp.

Female: Head pale yellowish, thorax bright yellow with reddish-brown markings of different sizes and shapes; antennae, propodeum, and abdomen fuscous except with a faint yellow spot on dorsal and lateral tergites. Wings hyaline with yellowish brown. Legs yellow except apical segment of tarsi fuscous.

Head pale yellowish except between ocelli marked with brownish to fuscous. A v-shaped fuscous pattern on mid dorsum of thorax with widest end at pronotum and narrowest part toward scutellum. Mesonotum with a median grooved line; furrows on mesoscutum distinct; propodeum rather smooth with median and lateral carina; mesosternite fuscous.

Head rather narrow anteroposteriorly, as wide as thorax and a little wider than deep; scrobes rather deep; frontovertex broad; ocelli in an arc, posterior pair separated from inner eye margins by about twice their own diameter and from occipital margin by one-half their own diameter.

Antennae rather short; scape cylindrical; pedicel twice as long as wide at apex; funicle segment 1 nearly as long as pedicel, 3 times as long as wide, segments 1 to 3 subequal in length, as broad as pedicel; club little wider than preceding segment and as long as last two funicle segments combined.

Cilia of fore wings minute, except at base. Cilia of hind wings short except longer at posterior margin. Abdomen conic-ovate, pointed toward apex and nearly twice as long as head and thorax combined; ovipositor sheaths slightly produced.

Length of body 2 mm.

Holotype, female (BISHOP 3566), Guam, Yigo, Mariana Is., Dec. 1958, Krauss. Paratypes, Guam, Yigo, female, Feb. 1958; two females, Oct. 1957, Krauss.

DISTRIBUTION: Mariana Is. (Guam).

This species is related to *T. burrus* but differs from that species by its brilliant yellow mixed with brownish to fuscous markings on the thoracic region; funicle segment 1 three times as long as wide; face pale yellowish except for darker-brown ocellar region.

12. Tetrastichus burrus Yoshimoto and Ishii, n. sp. (fig. 4).

Female: Generally reddish brown to yellowish brown; antennae concolorous with body, but club rather brownish; mesoscutum suffused with brown. Abdomen dark brown except extreme base reddish brown. Wings hyaline with veins pale yellowish brown. Legs pale yellowish red.

Head minutely shagreened; pronotum, mesoscutum, and scutellum minutely shagreened, appearing like minute longitudinal striations; furrows on mesoscutum and scutellum distinct; propodeum rather smooth with median and lateral carinae; abdomen also minutely shagreened.

Head rather narrow anteroposteriorly, as wide as thorax and a little wider than deep; scrobes rather deep; frontovertex broad; ocelli in an arc, posterior pair separated from inner eye margins by about twice their own diameter and from occipital margin by one-half their own diameter.

Antennae rather short; scape cylindrical; pedicel twice as long as wide at apex; funicle segment 1 nearly as long as pedicel and twice as long as wide; funicle segments 2 and 3 a little shorter than 1; club a little wider than preceding segment and as long as last two funicle segments combined.

Wings uniformly ciliate except at base. Abdomen conic-ovate, pointed toward apex and a little shorter than head and thorax combined; ovipositor sheaths moder-

ately produced and about one-third length of abdomen.
Length of body, 1 mm.

Holotype, female (BISHOP 3567), Mt. Unibot, Tol I., Truk, low native forest, alt. 25-50 m., Jan. 1, 1953, Gressitt. Paratypes (BISHOP, US): Female, Yap I., Oct. 1952, Krauss; female, Ngaiangl Atoll, May 9, 1957, Sabrosky; female, Truk, Tol I., Mt. Unibot, 390 m., light trap, native forest, Dec. 31, 1952, Gressitt.

DISTRIBUTION: Caroline Is. (Yap, Ngaiangl, Truk).

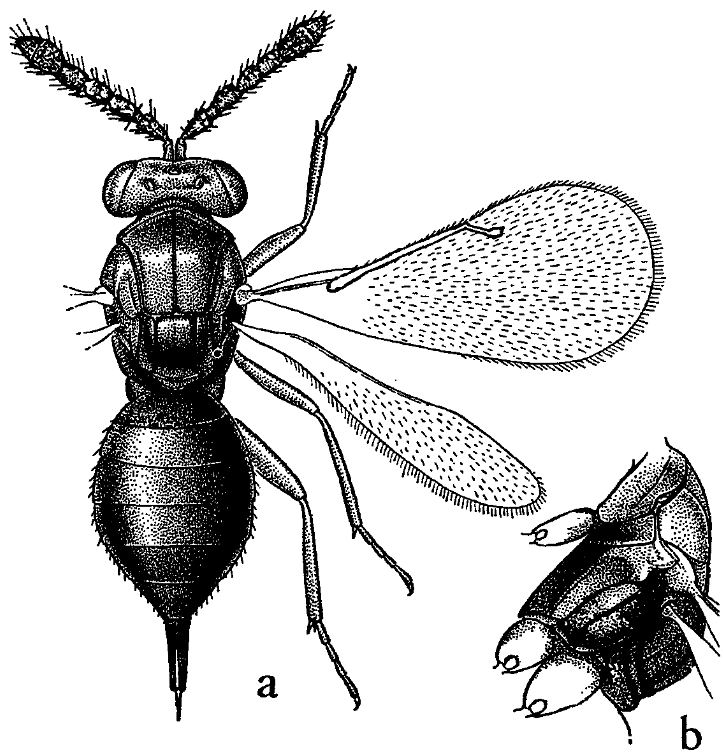


FIGURE 4.—*Tetrastichus burrus*, female: **a**, dorsal view; **b**, lateral view.

13. **Tetrastichus gressitti** Yoshimoto and Ishii, n. sp. (fig. 5).

Female: Black with a metallic-green reflection, but basal half of antennae and of abdomen reddish brown; frontovertex yellowish brown except surrounding part of ocelli black. Distal half of antennae and tegulae yellowish brown. Wings hyaline with veins pale brown; legs yellowish red except hind coxae black.

Head and pronotum minutely shagreened; mesoscutum and scutellum minutely shagreened, appearing like fine striations; propodeum shagreened with median and lateral carinae. Abdomen also minutely shagreened.

Head as wide as thorax, slightly narrower than deep and narrowed anteroposteriorly; scrobes rather deep; ocelli in an arc, posterior pair separated from inner eye margins by twice their own diameter and from occipital margin by about one-half their own diameter. Antennae rather long; pedicel three times as long as wide at apex; funicle segment 1 a little longer than pedicel, four times as long as wide; segment 2 a little shorter than 1; segment 3 a little shorter than 2; club slightly wider than last funicle segment and as long as last two funicle segments combined.

Wings uniformly ciliate except at base. Abdomen conic-ovate with segments subequal in length, a little longer than head and thorax combined; ovipositor sheaths nearly one-fourth length of abdomen.

Length of body, 0.96 mm.

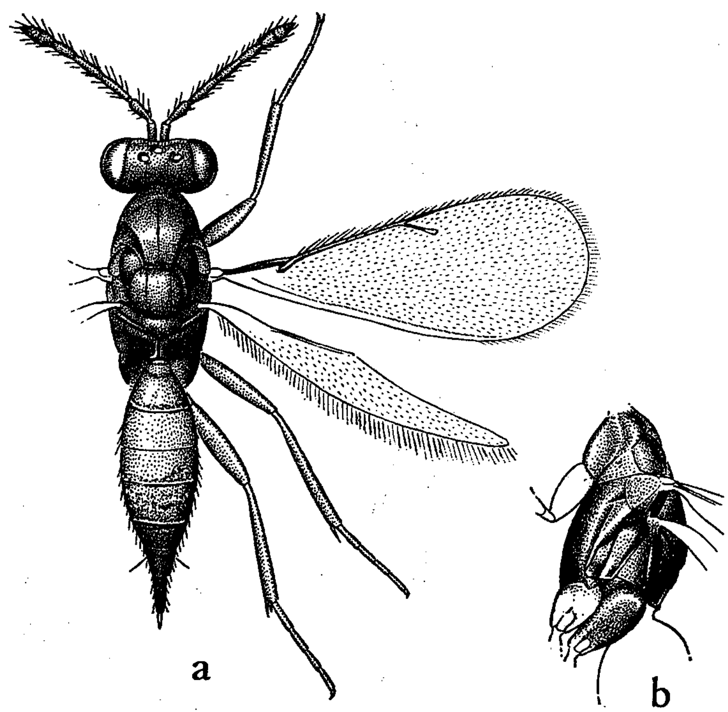


FIGURE 5.—*Tetrastichus gressitti,* female: **a**, dorsal view; **b**, lateral view.

Holotype, female (BISHOP 3568), Mt. Iron, Fefan I., Truk, Jan. 31, 1953, Gressitt. Paratypes: Female, Pingelap Atoll, Caroline Is., Jan. 26, 1953, Gressitt; female, Satawan Atoll, Nov. 2, 1952, Beardsley; female, E. Ngatpang, Babelthuap I., Palau, 65 m., Dec. 8, 1952, sweeping, Gressitt.

DISTRIBUTION: Caroline Is. (Palau, Pingelap, Satawan, Truk).

14. Tetrastichus brontispae (Ferrière).

Tetrastichodes brontispae Ferrière, 1933, Stylops 2: 100.—Doutt, 1950, Hawaiian Ent. Soc., Proc. **14** (1): 55-58.

DISTRIBUTION: Java, New Guinea, S. Mariana Is.

S. MARIANA IS. SAIPAN: Six females, Aug. 1948, ex *Brontispa*, Doutt.

Genus **Melittobia** Westwood

Melittobia Westwood, 1847, Ent. Soc. London, Proc. **5** (3): xviii, lxv (type: *Melittobia audouinii* Westwood = *Cirrospilus acasta* Walker, monobasic). —Peck, 1963, Canadian Ent., Suppl. **30**: 161-163.

This genus is cosmopolitan in distribution and well represented in southeast Asia, Australia, New Guinea, Borneo, Philippines, New Zealand, and islands of the Pacific.

15. Melittobia hawaiiensis Perkins.

Melittobia hawaiiensis Perkins, 1907, Hawaiian Ent. Soc., Proc. **1**: 124, female.

DISTRIBUTION: S. Mariana Is., E. Caroline Is., Hawaii, Wake I.

S. MARIANA IS. GUAM: Female, Piti, May 1936, Swezey; six males, 10 females (US), Piti, Sept. 1936, from nest of *Pison argentatum*, Swezey.

TRUK. Two females (US), Feb. 1948, from mud cell of wasp, Maehler.

WAKE. Three females (US), Nov. 1959, Ford.

This species is known to parasitize larvae of *Megachile palmarum* Perkins, *Pison argentatum* Schuckard, *P. hospes* Smith, *Odynerus nigripennis* (Holmgren), *Pachodynerus simplicicornis* Saussure, *Sceliphron caementarium* (Drury), and *Ereunetis flavistriata* Walsingham (Swezey, 1907, Hawaiian Sugar Plant. Assoc. Expt. Sta., Ent. Bull. **5**: 50-53; 1908, Hawaiian Ent. Soc., Proc. **2**: 17-18). A case of hyperparasitism on a sarcophagid fly, *Amobia* sp., that had parasitized a *Sceliphron caementarium* larva, was reported by Mitchell (1952, Hawaiian Ent. Soc., Proc. **14**: 369).

Genus **Melittobiopsis** Timberlake

Melittobiopsis Timberlake, 1926, Hawaiian Ent. Soc., Proc. **6**: 317-319 (type: *Melittobiopsis ereunetiphila* Timberlake; monobasic).

16. Melittobiopsis ereunetiphila Timberlake.

Melittobiopsis ereunetiphila Timberlake, 1926, Hawaiian Ent. Soc., Proc. **6**: 319-320.—Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 217.

DISTRIBUTION: Indonesia, Hawaii, S. Mariana Is.

S. MARIANA IS. GUAM: Male, Piti, May 1936, Swezey; female (US), Agana, May 1936, Swezey. SAIPAN: 30 females, July 1948, sweeping cane, Doutt (on slides).

This species is rare in collections; many entomological institutions in Hawaii have few or no specimens. *M. ereunetiphila* was reared from larvae of *Ereunetis flavistriata* Walsingham, the sugar cane bud moth (Timberlake, op. cit.; Swezey, 1940, Hawaiian Ent. Soc., Proc. **10**: 457-458).

Genus **Ootetrastichus** Perkins

Ootetrastichus Perkins, 1906, Hawaiian Sugar Plant. Assoc. Expt. Sta., Ent. Bull. **1**: 263 (type: *Ootetrastichus beatus* Perkins).

KEY TO SPECIES OF MICRONESIAN OOTETRASTICHUS

Mesonotum and metanotum yellowish with brown markings..........**17. beatus**
Mesonotum and metanotum entirely brownish..........**18. formosanus**

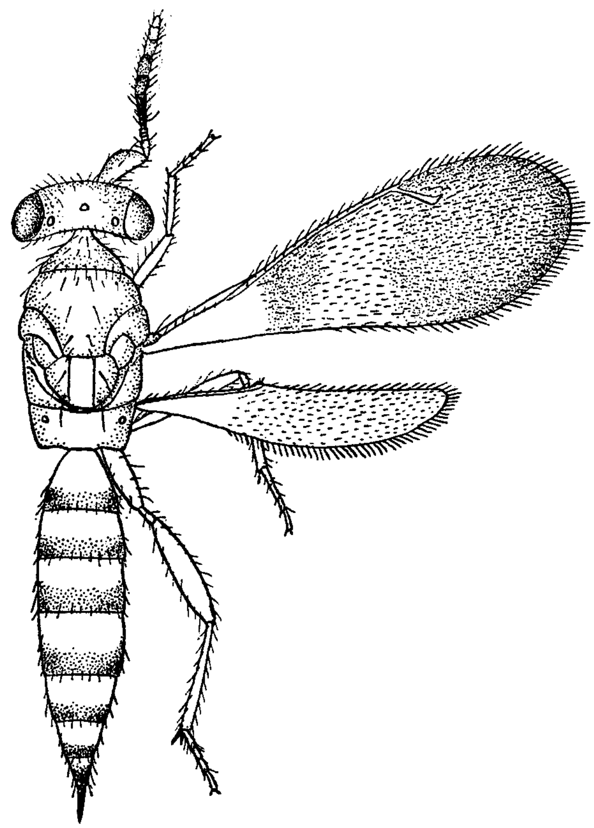


FIGURE 6.—*Ootetrastichus beatus*, female, dorsal view.

17. **Ootetrastichus beatus** Perkins (fig. 6).

Ootetrastichus beatus Perkins, 1906, Hawaiian Sugar Plant. Assoc. Expt. Sta., Ent. Bull. **1**: 263-264.

DISTRIBUTION: Hawaii, Australia, S. Mariana Is., Caroline Is.

S. MARIANA IS. SAIPAN: Female, Jan. 1958, Krauss. GUAM: Female, Piti, May 1936, Swezey.

PALAU. BABELTHUAP: Female, Ulimang, Dec. 1947, Dybas; female, Malakal I., May 1957, Sabrosky.

The male is unknown.

18. Ootetrastichus formosanus Timberlake.

Ootetrastichus formosanus Timberlake, 1921, Hawaiian Ent. Soc., Proc. **4**: 558-564.

DISTRIBUTION: Hawaii, S. Mariana Is., Caroline Is.

S. MARIANA IS. GUAM: Female, Potts Junction, Oct. 1952, Krauss.

PALAU. ULEBSEHEL: Two males, Nov. 1952, Krauss. BABELTHUAP: Male, Ulimang, Dec. 1947, Dybas.

YAP. YAP: Female, Oct. 1952, Krauss.

CAROLINE ATOLLS. PINGELAP: Female, Jan. 1953, Gressitt.

PONAPE. Female, Mt. Kupuriso, n. slope, about 312-470 m., Mar. 1952, Dybas.

Genus **Paratetrastichus** Yoshimoto and Ishii, new genus

Antennae 11-segmented with short cylindrical solid club. Scape flat, triangular-shaped, twice as long as broad; pedicel twice as long as wide at apex, three ring segments, segments subequal in length and width; funicle segment 1 longest, widened gradually toward apex, funicle segment 2 a little shorter and slightly wider than 1, and also widened gradually toward apex; 3 and 4 subcylindrical, a little shorter than and as wide as 2; club a little shorter than preceding two funicle segments combined. Hind tibial spur single. Marginal vein long, three times longer than submarginal and also equally longer than stigmal; postmarginal absent. Parasidal furrows complete; scutellum distinct. Marginal cilia of fore wing rather long, other areas uniformly ciliate except base without cilia.

Type species: *Paratetrastichus ponapensis,* n. sp., by present designation.

During the early stages of this work, this group was placed with the genus *Ootetrastichus* Perkins. Dr. Burks kindly examined the type specimen of this group and suggested that this was an undescribed genus, so we hereby describe it as new.

This genus is closely related to *Ootetrastichus* but differs in the three ring segments and the distinctly four-segmented funicle of the antennae.

19. Paratetrastichus ponapensis Yoshimoto and Ishii, n. sp. (fig. 7).

Female: Pale yellowish brown in general; furrows of scutellum black; hind margins of abdominal segments rather broadly brown. Antennae with scape and pedicel pale yellowish brown, but scape pale brown in lower part; funicle segments and basal half of first segment of club brown; remaining part of club whitish. Fore wings almost hyaline except a pale-brown transverse fascia near base and a pale-brown transverse fascia in apical third, the latter fascia with outer margins brown; veins pale brown. Hind wings and veins very pale brown. Legs concolorous with body, but apex of hind tibiae brownish.

Head, pronotum, mesonotum, propodeum, and abdomen very finely shagreened; propodeum with a median carina.

Head as wide as thorax; face convex without scrobes and with rather coarse hairs; frontovertex broad; ocelli in a very obtuse-angled triangle, posterior pair separated from inner eye margins by about twice their own diameter and very near to occipital margin.

Antennae inserted somewhat above middle of face; scape greatly expanded beneath, about twice as long as broad. Scape and pedicel with sparse, rather long hairs; funicle segments and club with coarse hairs.

Pronotum acute anteriorly; mesoscutum with distinct parapsidal furrows; prono-

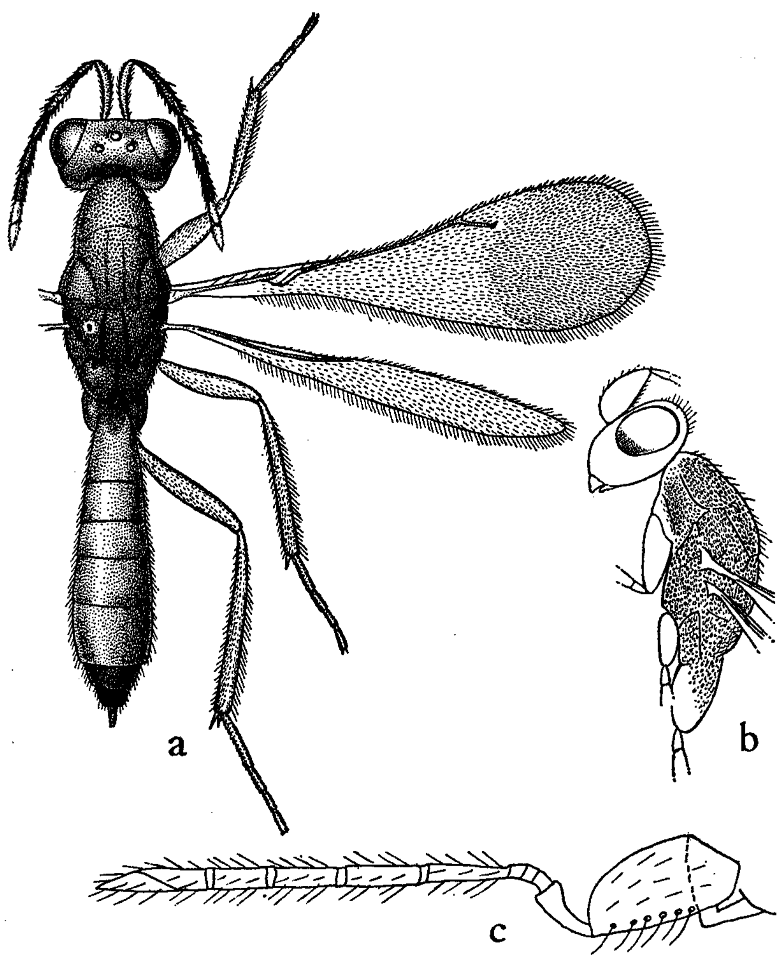


FIGURE 7.—*Paratetrastichus ponapensis*, female: **a**, dorsal view; **b**, lateral view; **c**, antenna.

tum and mesoscutum with sparse hairs; sulci of scutellum distinct, submedian pair slightly divergent posteriorly; scutellum with two pairs of bristles just outside submedian sulci; anterior pair just before middle and other pair near apex.

Abdomen a little shorter than head and thorax combined, and gradually narrowed toward apex; segments subequal in length, with sparse hairs. Ovipositor sheaths not extruded, normally enclosed by elongate apical abdominal tergum.

Fore wings ciliate except basal part and marginal ciliae rather long; submarginal, marginal, and stigmal approximately in a ratio of 10: 30: 9: postmarginal vein absent; marginal vein with about 15 bristles. Hind wings ciliate except at base, marginal ciliae rather long.

Legs with rather long hairs, hind femora and tibiae stout.

Length of body, 1.44 mm.

Male: Similar to female in general except for antennae and color of wings. Antenna much more slender than those of female; scape expanded beneath as in female; pedicel twice as long as wide at apex; ring-segmented; all funicle segments cylindrical and subequal in width, segment 1 longest; segment 2 a little shorter than 1; segment 3 slightly shorter than segment 2 and as long as segment 4; club as long as preceding two funicle segments combined, club segments subequal in length.

Wings much darker than those of female. Abdomen brown at posterior half.

Length of body, 1.44 mm.

Holotype, female (US 67520), Kupwuriso, Ponape I., slope, about 312-470 m., Mar. 11, 1948, Dybas. Allotype, male (US), Nanipil, Net Distr., Ponape I., Feb. 25, 1948, Dybas. Paratypes (BISHOP, US, CM): 10 males and 6 females; Nanipil, Net Distr., Jan. 18, 1953, Gressitt; Mt. Kupwuriso, N. slope, about 312-470 m., Mar. 11, 1948, Dybas; Mt. Temwetemwensekir, summit, about 470 m., Mar. 23, 1948, Dybas; Nanipil, Net Distr., Feb. 25-27, 1948, Dybas; Agric. Expt. Sta., Colonia, alt. 16 m., Jan. 18, 1953, Gressitt.

DISTRIBUTION: Caroline Is. (Ponape).

Subfamily Elachertinae

Key to Genera of Micronesian Elachertinae

1. Hind tibiae with very long spurs 2
   Hind tibiae with spurs shorter than basitarsus 3
2. Abdomen subpetiolate .... **Euplectrus**
   Abdomen sessile or subsessile .... **Cirrospiloideus**
3. Abdomen petiolate .... **Entodonomorpha**
   Abdomen sessile or subsessile .... **Elachertus**

Genus **Euplectrus** Westwood

Euplectrus Westwood, 1832, Philosoph. Mag. **1** (3): 128 (type: *Euplectrus maculiventris* Westwood = *Pteromalus bicolor* Swederus; monobasic).—Peck, 1963, Canadian Ent., Suppl. **30**: 164-169.

Key to Species of Micronesian Euplectrus

Malar space equal to two-thirds height of eye; eyes subovate to ovate .... **20. xanthocephalus**

Malar space equal to one-fourth height of eye; eyes hemispherical .... **21. leucostomus**

20. Euplectrus xanthocephalus Girault.

Euplectrus xanthocephalus Girault, 1913, Queensland Mus., Mem. 2:273-274.—Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 217.

DISTRIBUTION: Australia, S. Mariana Is., Caroline Is.

S. MARIANA IS. GUAM: Female, Upi Trail, May 1936, ex ferns, Swezey; three females, Machanao, June 1936, ex larvae on spiny amaranth, Swezey; female, Pilgo River, May 1945, Bohart and Gressitt.

YAP. RUMUNG: Female, July-Aug. 1950, Goss; female, Yap Group, Aug. 1950, Goss. YAP: Four females, Aug., Oct. 1952, Krauss.

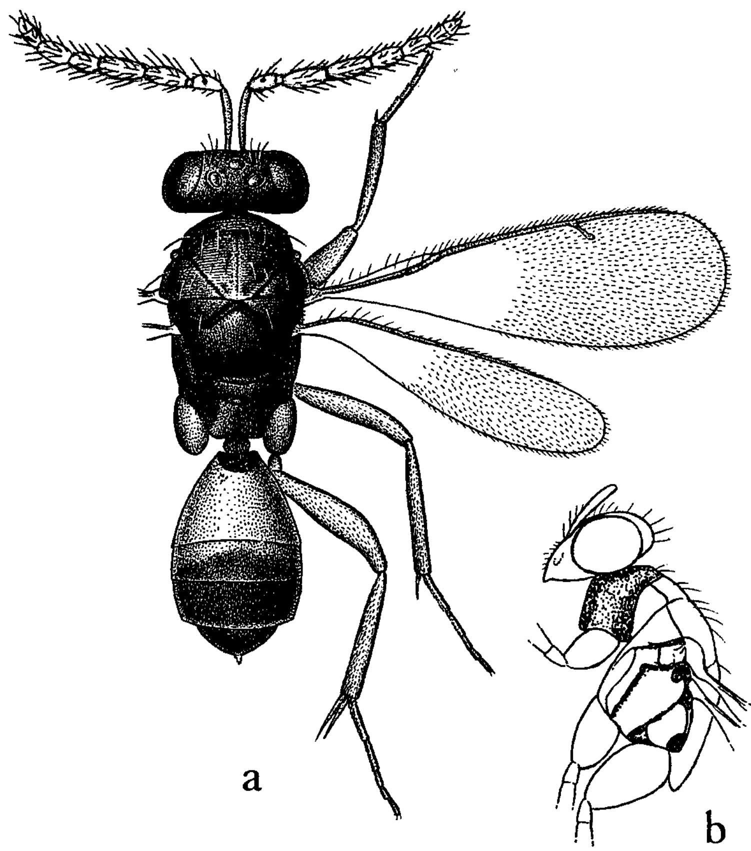


FIGURE 8.—*Euplectrus leucostomus*, female: **a**, dorsal view; **b**, lateral view.

21. Euplectrus leucostomus Rohwer (fig. 8).

Euplectrus leucostomus Rohwer, 1921, Ann. Mag. Nat. Hist. IX, **7**: 134. —Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 217.

DISTRIBUTION: S. Mariana Is.

S. MARIANA IS. GUAM: Three females, Machanao, June 1936, ex larva on *Eugenia*, Swezey.

Genus **Elachertus** Spinola

Elachertus Spinola, 1811, Mus. Nat. Hist., Paris, Ann. **17**: 151 (type: *Diplolepis lateralis* Spinola), designated by Gahan and Fagan, 1923.—Peck, 1963, Canadian Ent., Suppl. **30**: 173-177.

Key to Species of Micronesian Elachertus

1. Thorax black to fuscous; legs excluding coxae reddish brown to brownish.......... 2
   Thorax brownish yellow to brown; legs including coxae, pale yellow....**24. ponapensis**
2. Coxae partly blackish to fuscous....................................**23. nigricoxatus**
   Coxae brownish yellow to brown....................................**22. advena**

22. Elachertus advena Timberlake.

Elachertus advena Timberlake, 1926, B. P. Bishop Mus., Bull. **31**: 33-37, male, female.

DISTRIBUTION: Hawaii, S. Mariana Is., Caroline Is., Nauru.

S. MARIANA IS. Guam: Female, Piti, May 1936, Swezey; female, Pt. Ritidian, May 1945, Gressitt; two males, Pt. Oca, Apr. 1945, Bohart and Gressitt.

PALAU. Ulebsehel (Auluptagel): Female, Sept. 1952, Krauss.

CAROLINE ATOLLS. Elato: Two females, Elato I., Feb. 1953, Beardsley.

PONAPE. Three females, Agric. Expt. Sta., June-Sept. 1950, Adams.

KUSAIE. Female, Mutunlik, Jan. 1953, Gressitt.

NAURU: Female, Oct. 1953.

Timberlake (1924) reported that this species was reared from *Hypothenemus* sp. (Coleoptera: Scolytidae).

23. Elachertus nigricoxatus Yoshimoto and Ishii, n. sp. (fig. 9).

Black except abdomen reddish brown; antennae dark brown except scape and pedicel reddish brown; legs reddish brown except coxae bluish black. Wings hyaline with veins pale brown; tegulae brown.

Head shagreened; pronotum reticulate; mesoscutum with distinct parapsidal furrows and scaly reticulate; axillae smooth and shining; scutellum polished, lightly reticulate and with distinct foveolated furrows; mesopleurae smooth; metapleurae scaly reticulate; propodeum rugose with a median and a lateral carina; about three oblique striae running from median carina; abdomen smooth.

Head hairy, slightly wider than thorax; frontovertex rather broad; ocelli in an obtuse-angled triangle, posterior pair separated from inner eye margins by their own diameter; occiput not margined; scrobes shallow. Antennal scape cylindrical; pedicel nearly twice as long as wide at apex; funicle segments cylindrical and gradually decreasing in length distad; funicle segment 1 considerably longer than pedicel; club a little longer than last funicle segment.

Pronotum rather long with rather thick gray hairs. Abdomen conic-ovate, much longer than head and thorax combined; ovipositor sheaths slightly produced. Wings ciliate except at extreme base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 20: 23: 8: 5.

Length of body, 1.65 mm.

Holotype, female (BISHOP 3569), Koror, Palau Is., June 1953, Beardsley. Paratypes (BISHOP, US): Three females, same data as holotype; one female, Yap, Yap Is., July-Aug. 1950, Goss.

DISTRIBUTION: Caroline Is. (Palau, Yap).

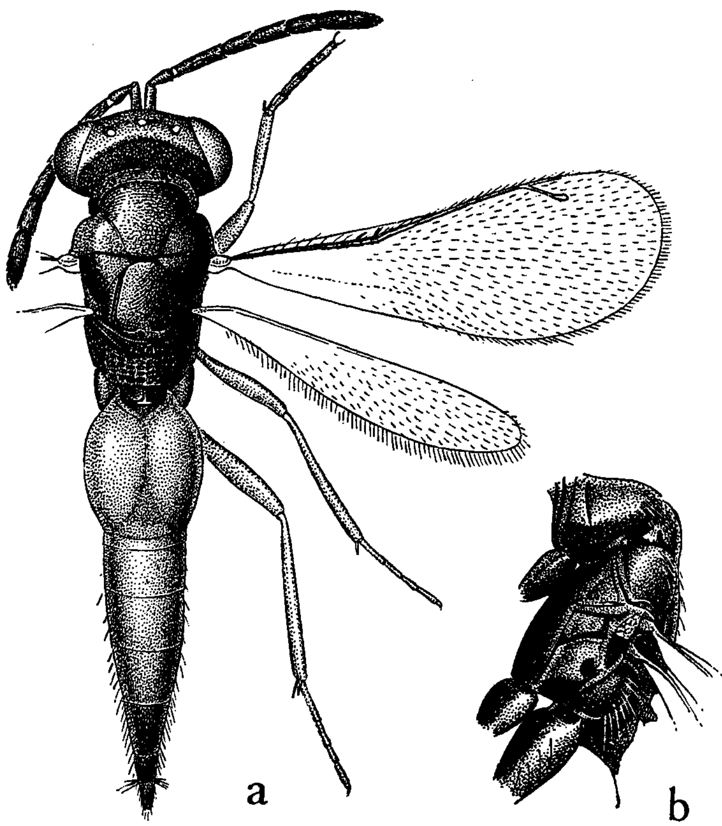


FIGURE 9.—*Elachertus nigricoxatus,* female: **a,** dorsal view; **b,** lateral view.

24. **Elachertus ponapensis** Yoshimoto and Ishii, n. sp.

Female: Brownish yellow to brown in general; posterior margin of pronotum and scapulae reddish brown. Antennae brown except scape and pedicel pale yellowish brown; tegulae pale brown; wings hyaline, veins pale brown; legs pale yellow.

Head shagreened; frontovertex nearly smooth and shining; pronotum shagreened; mesoscutum and scutellum reticulate, but anterior part of mesoscutum smooth and shining; propodeum smooth and shining with two median carinae diverging anteriorly and posteriorly.

Head a little wider than thorax; scrobes rather shallow; ocellus in an obtuse-angled triangle, posterior pair separated from inner eye margins and occipital margin by twice their own diameter. Antennal scape rather long and cylindrical; pedicel a little longer than wide at apex; funicle segments subcylindrical and subequal in length

and width, but the last segment a little shorter; funicle segment 1 considerably longer than pedicel and twice as long as wide; club a little longer than last funicle segment.

Fore wings uniformly ciliate except at extreme base; ratio of submarginal, stigmal, and postmarginal veins approximately 20: 24: 12: 5. Hind wings also uniformly ciliate except at base.

Abdomen ovate, nearly as long as thorax; petiole very short; ovipositor sheaths slightly produced.

Length of body, 1 mm.

Holotype, female (US 67521), Mt. Kupwuriso, Ponape, Caroline Is., about 314-470 m., March 11, 1948, Dybas. Paratype, female (BISHOP), Mt. Nahnalaud, Ponape, Caroline Is., about 160-470 m., Mar. 19, 1948, Dybas.

DISTRIBUTION: Caroline Is. (Ponape).

Genus **Entedonomorpha** Girault

Entedonomorpha Girault, 1913, Queensland Mus., Mem. 2: 270.

25. **Entedonomorpha guamensis** Yoshimoto and Ishii, n. sp.

Female: Head, thorax, and petiole jet black; legs including coxae yellowish; abdomen yellowish except brown band on anterior margin of second tergite. Antennal scape and pedicel yellow, flagellum brownish. Fore wing coriaceous, hyaline near base; veins pale brown. Hind wing and veins pale brown.

Head smooth and polished, wider than thorax. Face convex with rather shallow scrobes and column of hairs along occipital margin. Frontovertex broad; ocelli in obtuse-angled triangle, posterior pair separated from inner eye margins by nearly twice their own diameter and distinctly away from occipital margin.

Antennae inserted below middle of face, scape cylindrical and slightly bent inward in middle, about eight times as long as broad; pedicel twice as long as broad, two ring segments; funicle segment 1 twice as long as broad; segments 2 and 3 flattened on both sides, 1.5 times as long as wide, together shorter than 1; between funicle segments petiolate; club 3-segmented, two and one-half times as long as wide, as broad as two preceding segments; funicle segments and club with coarse hairs.

Pronotum rounded anteriorly; anterior two-thirds of pronotum reticulate and sparsely bristled. Anterior part of mesoscutum reticulate; parapsidal furrows present. Petiole as long as broad and punctate rugose; abdomen ovate, shorter than thorax; segment 1 two-thirds as long as abdomen; ovipositor sheath very short.

Fore wings uniformly thickened, ciliate except at base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 5: 7: 1.5: 0. Posterior margin of hind wings uniformly ciliate except longer near base.

Length of body, 1.5-1.7 mm.

Holotype, female (BISHOP 3570), Ritidian Pt., Guam, Apr. 15, 1936, Bryan. Paratypes (BISHOP, US): Female, same data as holotype; female, Pt. Ritidian, Guam, June 28, 1945, Bohart and Gressitt.

DISTRIBUTION: S. Mariana Is. (Guam).

Genus **Cirrospiloideus** Ashmead

Cirrospiloideus Ashmead, 1904, Carnegie Mus., Mem. 1: 354, 355 (type: *Miotropis platynotae* Howard; monobasic).—Peck, 1963, Canadian Ent. Suppl. 30: 180-182.

Key to Micronesian Species of Cirrospiloideus

1.	Head black	2
	Head yellowish brown to reddish brown	3
2.	Scape twice as long as broad at apex; scutellum shallowly reticulate	**26. kraussi**
	Scape a little longer than broad at apex; scutellum deeply reticulate	**27. fullawayi**
3.	Funicle segment 1 a little longer than 2	**28. guamensis**
	Funicle segments 1 and 2 subequal in length	**29. japonica**

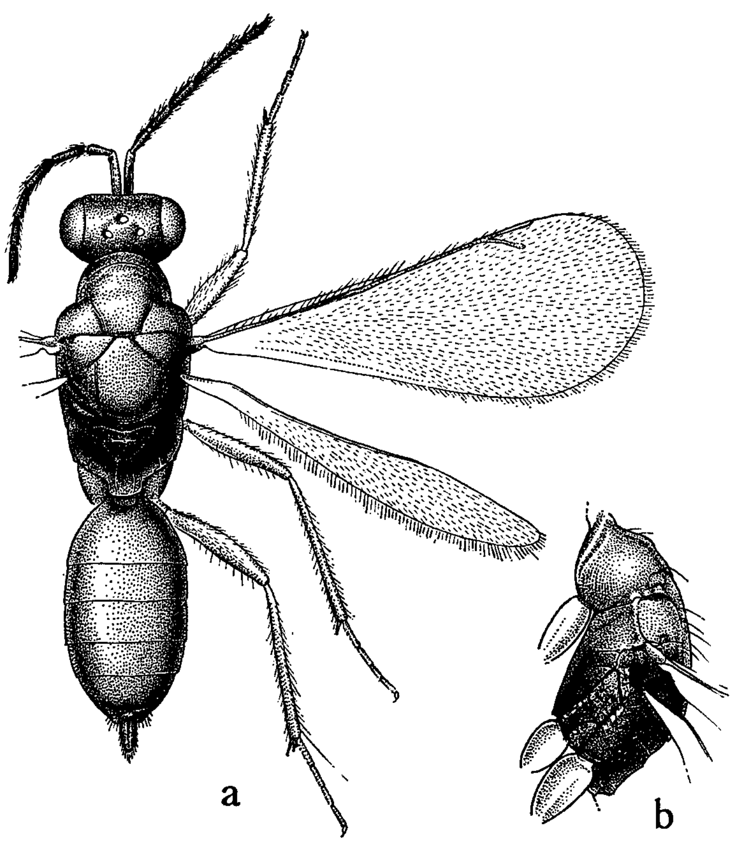


Figure 10.—*Cirrospiloideus kraussi,* female: **a,** dorsal view; **b,** lateral view.

26. **Cirrospiloideus kraussi** Yoshimoto and Ishii, n. sp. (fig. 10).

Female: Head, pronotum, mesothorax except mesoscutum, propodeum, and abdomen black; mesoscutum and margin of scutellum brownish yellow. Antennae brown except scape and pedicel brownish yellow.

Head, pronotum, mesoscutum, and axillae shagreened; scutellum shallow reticulate with two median carinae; mesopleura almost smooth; abdomen smooth.

Head as wide as thorax; scrobes shallow; ocelli in an obtuse-angled triangle, posterior pair separated from inner eye margin and occipital margin by nearly twice their own diameter.

Antennal scape cylindrical; one ring segment, pedicel twice as long as wide at apex; four funicle segments cylindrical and subequal in length; funicle segment 1 considerably longer than pedicel; club longer than last funicle segment.

Fore wings uniformly ciliate except at base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 20: 26: 6: 8. Hind wings uniformly ciliate except at base. Abdomen ovate, almost as long as thorax; ovipositor sheaths slightly produced.

Length of body, 1.5-1.75 mm.

Male: Similar to female except antennal segment black, head jet black.

Funicle segments of antennae elongate, somewhat flattened, 1.75 times longer than female. Abdomen shorter than thorax.

Length of body, 1.5 mm.

Holotype, female (BISHOP 3571), Ujae Atoll, Marshall Is., Oct. 15, 1953, Krauss; allotype, male (BISHOP), Sonsorol I., Caroline Is., Sept. 13, 1952, Krauss.

Paratypes (US, BISHOP, CM): Male, Yigo, Guam, Mariana Is., Dec. 1958, Krauss; male, Pilgo River, Guam, May 26, 1945, Bohart and Gressitt. Male, Yap, Map I., July-Aug. 1950, Goss. Female, Pingelap Atoll, Caroline Is., Jan. 25, 1953, Gressitt; female, male, Sonsorol Atoll, Caroline Is., Sept. 13, 1952, Krauss; female, Merir I., Caroline Is., Sept. 11, 1952, Krauss. Four females, male, Mt. Kupwuriso, slope, Ponape I., about 312-470 m., Mar. 11, 1948, Dybas; two males, Nanipil, Net Distr., Ponape I., Feb. 25, 1948, Dybas. Female, Lib I., Marshall Is., Oct. 23, 1953.

DISTRIBUTION: S. Mariana Is. (Guam), Caroline Is. (Pingelap, Merir, Sonsorol, Ponape), Marshall Is. (Ujae, Lib).

27. **Cirrospiloideus fullawayi** Yoshimoto and Ishii, n. sp.

Female: Brownish red in general with black markings. Head black with feeble green and purple reflections; pronotum black; mesoscutum brownish red with anterior part brown; axillae and scutellum brownish red; propodeum black; mesopleura and metapleura black. Abdomen brownish red in general; segments 1 and 4 with median black dots, and beyond segment 5 black. Antennae dark brown except scape brownish red. All legs yellowish red except fore and hind coxae black on outer side. Fore wings hyaline with a faint longitudinal club in disk; veins pale brown; hind wings hyaline.

Head faintly shagreened, nearly smooth and shining; pronotum, mesoscutum, and scutellum reticulate, axillae shagreened. Mesopleura smooth; metapleura reticulate; propodeum transverse strio-reticulate with a median and a lateral carina and an arched carina at base. Abdomen smooth, segments beyond segment 4 feebly shagreened.

Head a little wider than thorax; frontovertex very broad; scrobes shallow; ocelli in an obtuse-angled triangle, posterior pair separated from inner eye margins by about twice their own diameter and from occipital margin by about four times their own diameter.

Antennal scape cylindrical; pedicel a little longer than wide at apex; funicle segments cylindrical and subequal in length, but segment 4 a little shorter; funicle segment 1 about four times as long as pedicel; club nearly as long as segment 4.

Wings ciliate except at extreme base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 25: 40: 8: 17. Abdomen conic-ovate, much longer than head and thorax combined. Ovipositor not produced.

Length of body, 3.6 mm.

Holotype, female (BISHOP 3572), Ebon I., Ebon Atoll, Marshall Is., Sept. 27, 1953, Beardsley.

DISTRIBUTION: Marshall Is. (Ebon).

28. **Cirrospiloideus guamensis** Fullaway.

Cirrospiloideus guamensis Fullaway, 1913, Hawaiian Ent. Soc., Proc. **2**: 287.—Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 216.

DISTRIBUTION: S. Mariana Is., Caroline Is.

S. MARIANA IS. GUAM: Female, Umatac, ex leaf miner, May 1936; three females, Inarajan, ex leaf miner in vine, May, July 1936; female, Piti, hills, Sept. 1936; female, Orote Pen., May, July 1936; male, Machanao, June 1936, ex *Ficus* leaf miner; all by Swezey.

YAP. Female, Aug. 1952, Krauss.

CAROLINE ATOLLS. NOMWIN: Female, Nomwin I., ex *Caesalpinia* leaf miner, Feb. 1954, Beardsley.

PONAPE. Female, Mt. Temwetemwensekir, 180 m., Jan. 1953, light trap, Gressitt.

29. **Cirrospiloideus japonica** (Ashmead).

Sympiesomorpha japonica Ashmead, 1904, New York Ent. Soc., Jour. **12**: 163.

Cirrospiloideus japonica: Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 216.

DISTRIBUTION: Japan, S. Mariana Is., Caroline Is.

S. MARIANA IS. GUAM: Two females (US), Piti, May 1936, ex bean vines, Swezey; female, Pilgo River, May 1945, Gressitt; female, Mt. Lamlam, Feb. 1958, Krauss; female (US), Inarajan, May 1936, reared from bean leaf miner, Swezey.

PALAU. ANGAUR: Male (US), Feb. 1948, Dybas. KOROR: Female, Apr. 1957, Sabrosky.

CAROLINE ATOLLS. TOBI: Female, Sept. 1952, Krauss. WOLEAI: Female, Woleai I., Sept. 1952, Krauss; female, Feb. 1953, Beardsley.

SUBFAMILY ENTEDONTINAE

KEY TO GENERA OF MICRONESIAN ENTEDONTINAE

FEMALES

1. Antenna 8-segmented; fore wing with two or three oblique bands....... **Closterocerus**
   Antenna 10- to 11-segmented; fore wing hyaline or with a faint spot....... 2
2. Thorax shallowly reticulate....... 3
   Thorax with deep, minute reticulations....... **Derostenus**
3. Antenna 10-segmented; four funicle segments....... **Euderus**
   Antenna 11-segmented; three funicle segments....... **Burksia**

Genus **Closterocerus** Westwood

Closterocerus Westwood, 1833, Mag. Nat. Hist. **6**: 419.—Peck, 1963, Canadian Ent., Suppl. **30**: 192-196 (type: *Closterocerus trifasciatus* Westwood; monobasic).

30. Closterocerus sp. (fig. 11).

Female: Shining blue in general. Face below antennae and cheeks white; antennae dark brown with a greenish reflection. Fore wings hyaline with veins pale brown and uniformly ciliate and with a broad oblique brownish band extending from near tip of front margin to middle part of hind margin and a broad brownish band at base; between both bands more or less pale brown. Hind wings hyaline with veins pale brown and uniformly ciliate.

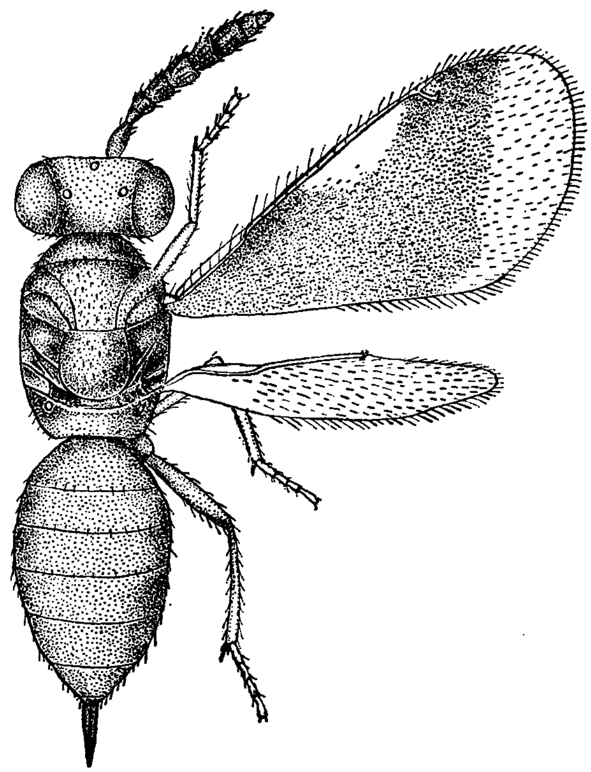


FIGURE 11.—*Closterocerus* sp., female, dorsal view.

Pronotum, mesoscutum, and scutellum with a greenish-blue reflection; propleuron whitish.

Head nearly smooth; frontovertex minutely scaly reticulate; pronotum, mesoepimerum smooth; propodeum smooth, abdominal segments nearly smooth and shining.

Legs yellowish brown except coxae concolorous with body; hind femora brownish with a blue-green reflection.

Frontovertex broad; ocelli in an obtuse-angled triangle, posterior pair separated from occipital margin by four times their own diameter and from inner eye margins by a little more than their own diameter.

Antennal scape stout and cylindrical; pedicel as long as wide at apex; funicle segments broad, wider than long, last segment slightly narrower than others; club narrower than last funicle segment and nearly as long as preceding two funicle segments combined.

Abdomen ovate and pointed toward apex and nearly as long as head and thorax combined; segment 1 slightly longer than other segments; following segments subequal in length. Ovipositor sheaths stout, about one-third length of abdomen.

Length of body, 1.12 mm.

DISTRIBUTION: Caroline Is. (Palau).

PALAU. KOROR: Female, Jan. 1948, Dybas.

Genus **Euderus** Haliday

Euderus Haliday, 1843 (1844), Ent. Soc. London, Trans. **3**: 298 (type: *Entedon amphis* Walker).—Peck, 1963, Canadian Ent., Suppl. **30**: 197-201.

Secodella Girault, 1913, Archiv Naturgesch. A **79** (6): 48.

KEY TO SPECIES OF MICRONESIAN EUDERUS

1. All coxae except hind coxae in part, pale yellow..**31. beardsleyi**
   All coxae metallic or brownish.. 2
2. Funicle segments three times as long as wide at apex...............................**32. yapensis**
   Funicle segments subequal in length and width......................................**33. metallicus**

31. **Euderus beardsleyi** Yoshimoto and Ishii, n. sp.

Female: Dark metallic green; antennae dark brown except scape pale yellow; wings hyaline with veins pale brown; legs pale yellow except basal part of hind coxae concolorous to body and terminal segments of all tarsi brown.

Head scaly reticulate; pronotum, mesoscutum, scutellum, propleura, and mesoepisternum reticulate; mesoepimeron smooth; propodeum with a middle carina and smooth. Abdomen scaly reticulate.

Head a little wider than deep; frontovertex broad; scrobes rather deep; ocelli arranged in an arc, posterior pair separated from inner eye margins by their own diameter and from occipital margin by one-half their own diameter, anterior ocellus just below upper margin of scrobes.

Antennal scape cylindrical; pedicel much shorter than funicle segment 1, as long as wide at apex; funicle segment 1 about three times as long as wide at apex; 2 considerably shorter than 1, and about twice as long as wide and almost as long as segment 3; segment 4 a little shorter than 3; club ovate, with a small nipple at apex, narrower and a little longer than last funicle segment.

Wings rather closely ciliate except at base, some ciliae forming lines. Hind wings ciliate except basal part.

Abdomen conic-ovate, lanceolate toward tip, much longer than head and thorax combined; segments subequal in length. Ovipositor sheaths very short, less than one-tenth length of abdomen.

Length of body, 2 mm.

Holotype, female (BISHOP 3573), Koror, Palau Is., Jan. 1954, Beardsley.

DISTRIBUTION: Caroline Is. (Palau).

This species is allied to *E. metallicus,* but it differs in the following characters: legs pale yellowish, the first funicle segment much longer, and ovipositor much shorter.

32. **Euderus yapensis** Yoshimoto and Ishii, n. sp.

Female: Dark metallic green; antennae dark brown except scape yellowish brown; wings hyaline; legs concolorous to body, but all tibiae yellowish brown in apical third, all tarsi yellow except terminal segment dark brown.

Head shagreened except frontovertex reticulated; pronotum shagreened; mesoscutum, scutellum, and mesopleura reticulate except mesoepimerum which is smooth. Propodeum with a middle carina, almost smooth, but lateral part shagreened. All coxae reticulate. Abdomen shagreened and shining.

Head a little wider than deep, frontovertex broad; ocelli in an arc, posterior pair separated from inner eye margins by one-half their own diameter and from occipital margin by twice their own diameter; scrobes rather shallow; a transverse furrow just below anterior ocellus.

Antennal scape cylindrical; pedicel twice as long as wide at apex and much shorter than funicle segment 1; funicle segment 1 three times as long as wide at apex; funicle segment 2 a little shorter than 1; following segments gradually decreasing in length distad; club ovate with a nipple at apex, slightly wider than last funicle segment and almost as long as three preceding segments combined.

Fore wings sparsely ciliate except basal part, cilia forming regular lines; postmarginal vein a little more than twice length of stigmal vein. Hind wings very sparsely ciliate.

Abdomen conic-ovate, lanceolate toward tip, much longer than head and thorax combined; segments subequal in length, segment 1 longest. Ovipositor sheaths very short, about one-eighth length of abdomen.

Length of body, 1.84 mm.

Holotype, female (US 67522), Yap I., Yap, hill behind Yaptown, Dec. 1, 1952, Gressitt.

DISTRIBUTION: Caroline Is. (Yap).

This species is closely allied to *E. metallicus* and *E. beardsleyi.* From the former it may be distinguished by the more greenish color and the much longer first funicle segment; from the latter by the color of the legs and the more sparsely ciliated fore wings.

33. **Euderus metallicus** (Ashmead) (fig. 12).

Omphale metallicus Ashmead, 1901, Fauna Hawaiiensis 1 (3): 327.

Secodella metallica (Ashmead): Timberlake, 1923, Hawaiian Ent. Soc., Proc. 5 (3): 440.

Euderus metallicus: Krauss, 1943, Hawaiian Ent. Soc., Proc. 9 (1): 92.

DISTRIBUTION: Hawaii, S. Mariana Is., Caroline Is.

S. MARIANA IS. GUAM: Female, Upi Trail, May 1936, Swezey.

PALAU. ULEBSEHEL: Female, Jan. 1953, Beardsley. BABELTHUAP: Female, Ngerchelong, Dec. 1947, Dybas.

YAP. YAP: Female, Mar. 1954, Beardsley.

This species is known to parasitize *Hyposmocoma empedota* Meyr. [Swezey, 1935, Hawaiian Ent. Soc., Proc. 9 (1): 94].

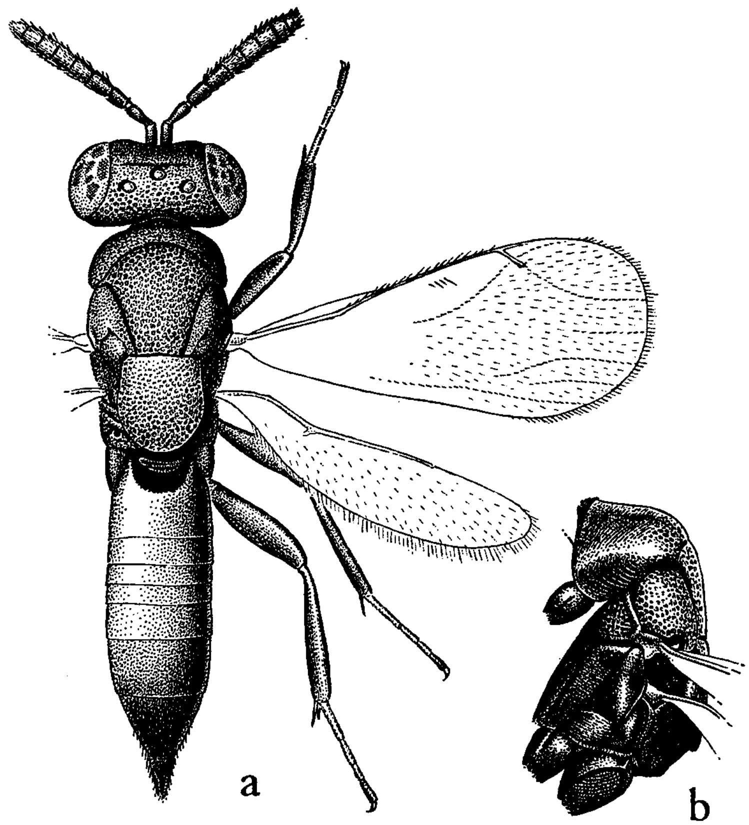


FIGURE 12.—*Euderus metallicus,* female: **a,** dorsal view; **b,** lateral view.

Genus **Burksia** Fullaway

Burksia Fullaway, 1955, Hawaiian Ent. Soc., Proc. **15**: 409 (type: *Burksia viridimaculata* Fullaway; monobasic).—Peck, 1963, Canadian Ent., Suppl. **30**: 201.

34. Burksia viridimaculata Fullaway.

Burksia viridimaculata Fullaway, 1955, Hawaiian Ent. Soc., Proc. **15**: 410.

DISTRIBUTION: Hawaii, Florida, S. Mariana Is.

S. MARIANA IS. GUAM: Female, Talofofo, Aug. 1962, Krauss; female, Cocos I., Oct. 1957, Krauss.

Genus **Derostenus** Westwood

Derostenus Westwood, 1833, Mag. Nat. Hist. **6**: 495 (type: *Derostenus gemmeus* Westwood; monobasic).—Peck, 1963, Canadian Ent., Suppl. **30**: 214-215.

35. **Derostenus fullawayi** Crawford.

Derostenus fullowayi Crawford, 1913, U. S. Nat. Mus., Proc. **46**: 348-349.

Achrysocharis fullawayi: Timberlake, 1924, Hawaiian Ent. Soc., Proc. **5**: 440.

DISTRIBUTION: Hawaii, S. Mariana Is.

S. MARIANA IS. GUAM: Four females, 1911, Fullaway.

Timberlake (1924) reported that this species was reared from *Agromyza pusilla* Meigen, *Cremastobombycia lantanella* Busck, *Gracilaria marginestrigata* Walsingham, *G. hibiscella* Swezey, and *Philodoria pipturiella* Swezey. It was also reared from *Phytomyza spicata* Malloch, as reported by Van Zwaluwenburg (1947).

FAMILY ENCYRTIDAE

SUBFAMILY EUPELMINAE

This subfamily is included in the family Encyrtidae by Ashmead (1904), Girault (1915), Brues and Melander (1954), B. D. Burks (personal communication), and Yoshimoto (1965),[3] though Viereck et al. (1916), Ferrière (1930), M. N. Nikol'skaya (1952), Peck (1951, 1963), Peck, Bouček, and Hoffer (1963), and other workers recognize it as a separate family.

Although there are other subfamilies of Micronesian Encyrtidae which have not yet been studied, I am treating only the subfamily Eupelminae in this paper. The Eupelminae are separated from other subfamilies of Encyrtidae by the mesonotum being usually depressed, occipital margin of vertex rounded, antenna with one ring segment, and the parapsidal furrows distinct and never entirely wanting.

Though eupelmines are a large group with many species, they are represented in Micronesia by fewer species than the eulophids. Of the 6 genera and 18 species in Micronesia, none of the genera are endemic, though there are several endemic species from this area.

Eupelmus is the largest genus but it is a complex one; out of nine known species from Micronesia, eight are endemic.

KEY TO GENERA OF MICRONESIAN EUPELMINAE

1. Eyes hairy 2
   Eyes not or only weakly hairy 5
2. Tibia and first tarsal segment of hind leg compressed 3
   Tibia and first tarsal segment of hind leg not compressed 4
3. Antennae inserted below middle of face; thorax black with greenish reflections .... **Metapelma**
   Antennae inserted near middle of face; thorax yellowish .... **Zaischnopsis**
4. Antennae inserted near middle of face .... **Anastatus, part**
   Antennae inserted just above clypeus .... **Merostenus**

[3] A synopsis of the Hawaiian Eulophidae, Pacific Ins., in press, includes a key to the families of Chalcidoidea.

5. Fore wing hyaline.. 6
   Fore wing smoky with a hyaline band.. **Anastatus**, part
6. Front indented below antennal groove.. **Eusandalum**
   Front not indented below antennal groove.. **Eupelmus**

Genus **Zaischnopsis** Ashmead

Ischnopsis Ashmead, 1896, Ent. Soc. Washington, Proc. **4**: 16. (Preoccupied by *Ischnopsis* Walsingham, 1881, in Lepidoptera. Type: *Ischnopsis opthalmica* Ashmead; monobasic.)

Zaischnopsis Ashmead, 1904, Ent. Soc. Washington, Proc. **6**: 126.—Peck, 1963, Canadian Ent., Suppl. **30**: 506.

36. Zaischnopsis usingeri Fullaway.

Zaischnopsis usingeri Fullaway, 1946, B. P. Bishop Mus., Bull. **189**: 202-203.

DISTRIBUTION: S. Mariana Is.

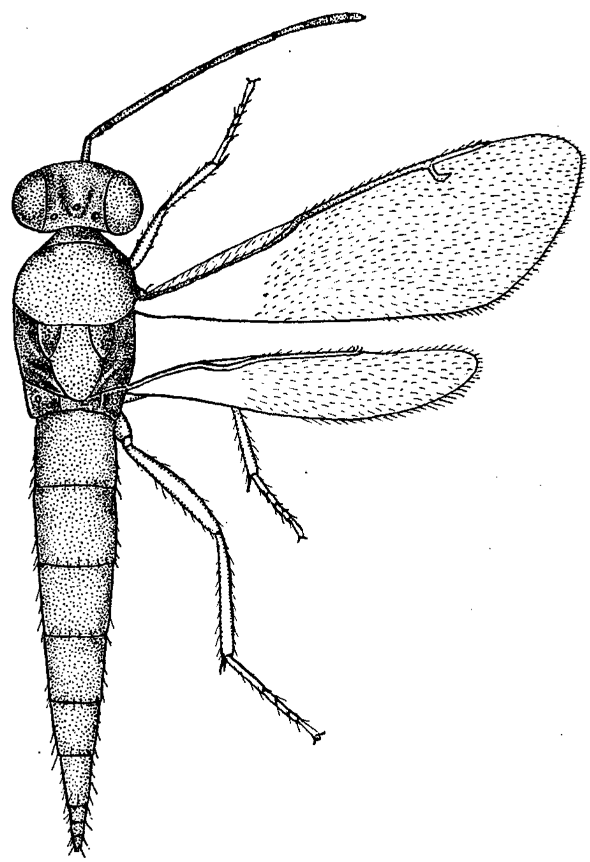


FIGURE 13.—*Eusandalum usingeri*, female, dorsal view.

Genus **Eusandalum** Ratzeburg

Eusandalum Ratzeburg, 1852, Ichneumonen der Forstinsecten **3** (type: *Eusandalum abbreviatum* Ratzeburg; designated by Ashmead, 1904).—Peck, 1963, Canadian Ent., Suppl. **30**: 472-475.

Meseusandalum Girault, 1915, Queensland Mus., Mem. **4**: 34.

37. Eusandalum usingeri Yoshimoto and Ishii, n. sp. (fig. 13).

Female: Black with a bluish-purple reflection, but head with a greenish luster; palpi pale brown. Antennae black and scape with a bluish reflection. Wings hyaline with veins pale brown; tegulae brown; legs yellowish brown except coxae concolorous with body. Head and thorax reticulate; abdomen shagreened.

Frontovertex moderately broad; face longitudinally furrowed; scrobes rather deep, sides serrated; eyes almost bare; ocelli in an obtuse-angled triangle, posterior pair very near to inner eye margins. Antennae rather long and slender; scape subcylindrical; pedicel twice as long as wide at apex; ring segment short and wider than long; funicle segments subequal in length, segment 1 a little longer than pedicel; club a little shorter than last two funicle segments combined.

Mesoscutum a little depressed; abdomen conic-ovate and pointed toward tip; ovipositor sheaths slightly produced.

Wings uniformly ciliate except base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 35: 30: 5: 14.

Length of body, 3.7 mm.

Holotype, female (BISHOP 3574), Barrigada, Guam, June 19, 1936, Usinger.

DISTRIBUTION: S. Mariana Is. (Guam).

Genus **Metapelma** Westwood

Metapelma Westwood, 1835, Zool. Soc. London, Proc. **3**: 69 (type: *Metapelma spectabile* Westwood; monobasic).—Peck, 1963, Canadian Ent., Suppl. **30**: 471-472.

38. Metapelma palauensis Yoshimoto and Ishii, n. sp. (fig. 14).

Female: Black with a strong greenish reflection except abdomen; antennae black; scape with a greenish reflection; tegulae black; fore wings infuscated except base; veins brown; hind wings hyaline. Legs black, but base of hind tibiae pale yellowish white. Ovipositor sheaths black. Head rather closely punctate; thorax and abdomen shagreened, latter almost smooth.

Head with sparse gray hairs; frontovertex moderately broad; eyes with sparse hairs; ocelli in an obtuse-angled triangle, posterior pair separated from inner eye margins; scrobes shallow. Antennae moderately long; scape a little widened at apical two-thirds; pedicel twice as long as wide at apex; funicle segment 1 slightly longer than pedicel and twice as wide as long; funicle segment 2 longest, three times as long as wide; funicle segment 3 as long as 2; 4 a little shorter than 1; segments 5 to 8 each slightly shorter and wider than 4; club ovate in form, as wide as preceding segment and as long as preceding two funicle segments combined.

Mesoscutum depressed, with two longitudinal keels at middle; parapsides also with a longitudinal ridge at middle; axillae meeting; scutellum rounded at apex; abdomen conic-ovate and pointed toward apex, a little shorter than thorax; segments

1 and 6 longest, with 6 a little longer than 1; ovipositor sheaths slightly shorter than abdomen, about 0.34 mm.

Fore wings uniformly thick, ciliate except at base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 45: 25: 5: 4. Hind wings also uniformly ciliate except at base and with a trace of basal vein. Hind coxae, hind tibiae, and first tarsal segment compressed.

Length of body, 4.5 mm.

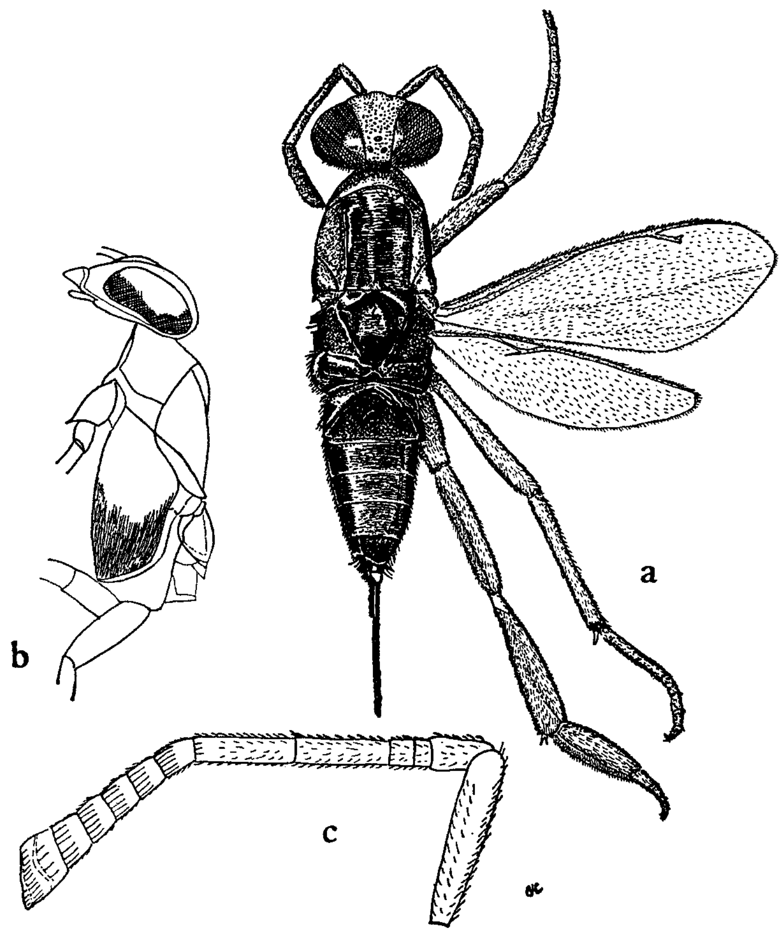


FIGURE 14.—*Metapelma palauensis,* female: **a,** dorsal view; **b,** lateral view; **c,** antenna.

Holotype, female (BISHOP 3575), Koror, Palau Is., March 1953, Beardsley.

DISTRIBUTION: Caroline Is. (Palau).

This species is somewhat allied to *M. westwoodi* Girault from New South Wales, Australia; however, in *westwoodi* the femora are tan, whereas they are black in *palauensis.*

Key to Females of Micronesian Species of Eupelmus

1. Head and body aeneus green, fuscous or black with a greenish or bluish luster 2
   Head black with a bluish luster........ **46. kororensis**

2(1). Head and body aeneus green; ovipositor sheaths nearly as long as abdomen .... **39. popa**
   Head and body otherwise; ovipositor sheaths much shorter than abdomen...... 3

3(2). Ovipositor sheaths of one color 4
   Ovipositor sheaths bicolored 5

4(3). Ovipositor sheaths very short .... **40. aeneus**
   Ovipositor sheaths as long as one-third length of abdomen........ **41. nigricoxus**

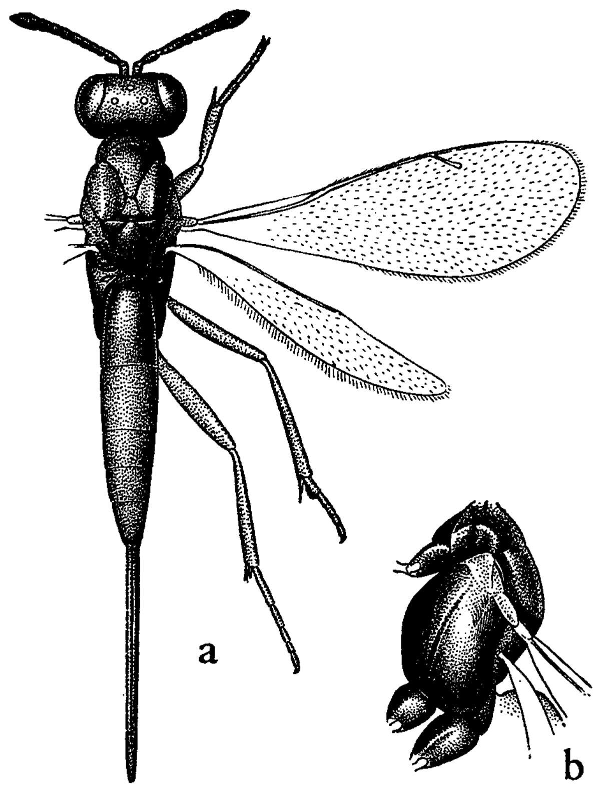


Figure 15.—*Eupelmus popa,* female: **a,** dorsal view; **b,** lateral view.

5(4). Head and thoracic notum strongly reticulate, with white hairs ....**43. carolinensis**
   Head and thoracic notum not so strongly reticulate, without white hairs........ 6

6(5). Abdominal segment 5 longer than 4........ **44. guamensis**
   Abdominal segment 5 equal in length to 4........ 7

7(6). Ocelli in an acute-angled triangle........ **45. viridiceps**
   Ocelli not in an acute-angled triangle........ 8

8(7). Ocelli in an equilateral triangle........ **42. microreticulatus**
   Ocelli in an obtuse triangle .... **41. boharti**

Genus **Eupelmus** Dalman

Eupelmus Dalman, 1820, K. Sven. Vet.-Akad., Handl. **41**: 136, 180 (type: *Eupelmus memnonius* Dalman; designated by Westwood, 1840).—Peck, 1963, Canadian Ent., Suppl. **30**: 475-490.

39. Eupelmus popa Girault (fig. 15).

Eupelmus popa Girault, 1917, Descr. Hymenopt. Chalcid. Var. Observ. **5**: 4.—Gahan, 1922, U. S. Nat. Mus., Proc. **61** (24): 14-16 (redescription).

DISTRIBUTION: U. S. mainland, Hawaii, West Indies, India, S. Mariana Is.

S. MARIANA IS. SAIPAN: 16 females, Garapan, April 1946, Krauss; eight females, Kobler Field, March 1958, Krauss. GUAM: Two females, Mt. Alifan, Oct. 1957, Krauss.

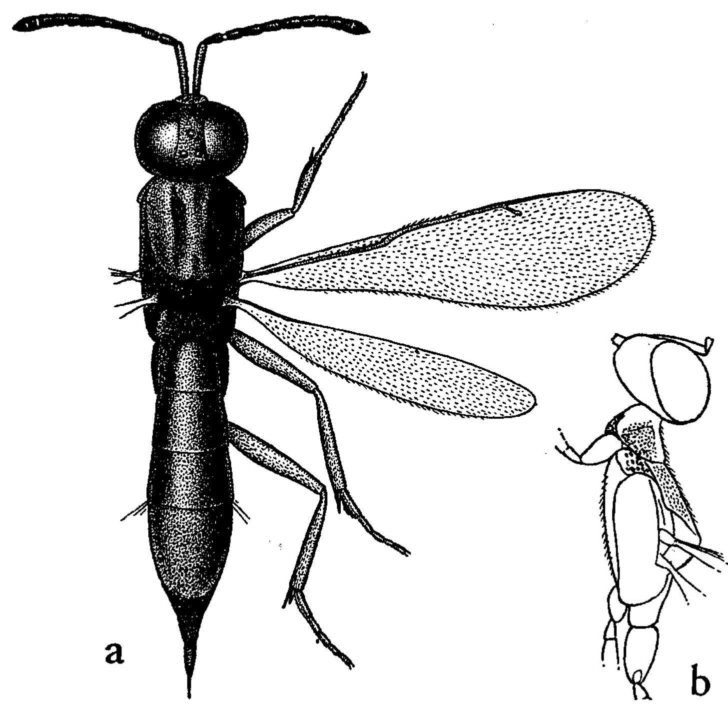


FIGURE 16.—*Eupelmus aeneus,* female: **a**, dorsal view; **b**, lateral view.

40. Eupelmus aeneus Yoshimoto and Ishii, n. sp. (fig. 16).

Female: Aeneus green in general. Antennae black with a greenish luster, but scape aeneus green. Wings hyaline with veins pale yellowish brown; tegulae yellowish

brown. Legs yellowish except tarsi whitish yellow; all coxae brown; fore femora except extreme base and fore tibiae except apex dark brown. Ovipositor sheaths dark brown.

Head shagreened; cheeks almost smooth; pronotum, mesonotum, and mesopleura scaly reticulate; scutellum longitudinally reticulate; abdomen transversely scaly reticulate.

Frontovertex rather narrow; eyes almost bare; ocelli in an acute-angled triangle; posterior pair very near to eye margins; scrobes not so deep. Antennae rather long; scape subcylindrical, slightly swollen at apical two-thirds; pedicel considerably longer than wide at apex; ring segment short, wider than long; funicle 7-segmented; segments 1 to 3 subequal in length, twice as long as wide and a little longer than pedicel; segments 4 to 7 slightly shorter, gradually increasing in width distad; club ovate, much wider than last funicle segment and as long as preceding three segments combined.

Mesoscutum considerably depressed; parapsides with a longitudinal raised ridge at middle. Abdomen conic-ovate, as long as head and thorax combined; segments 1 and 3 subequal in length; segment 2 shortest, about one-half length of segment 1; segments 4 and 5 longest, subequal in length and considerably longer than 3. Ovipositor sheaths very short, about 0.075 mm.

Fore wings uniformly ciliate except at base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 20: 16: 6: 6. Hind wings also uniformly ciliate except at base.

Length of body, 1.5 mm.

Holotype, female (BISHOP 3576), Pt. Taguan, Guam, July 10, 1945, Gressitt. Paratypes (BISHOP, US, MCZ): Female, Mt. Temwetemwensekir, 160 m., Ponape, Jan. 11, 1953, Gressitt; female, Agric. Expt. Sta., Ponape, June-Sept. 1950, Adams.

DISTRIBUTION: S. Mariana Is. (Guam), Caroline Is. (Ponape).

41. **Eupelmus nigricoxus** Yoshimoto and Ishii, n. sp. (fig. 17).

Female: Black with a greenish luster; antennae black; tegulae black; wings hyaline with pale-brown veins; legs yellow except coxae black; ovipositor sheaths black.

Head, pronotum and mesonotum shallow reticulate; abdomen shagreened; ocelli in a nearly equilateral triangle; posterior pair separated from inner eye margins by their own diameter. Mesoscutum depressed; parapsides longitudinally raised; propodeum almost smooth; abdomen a little longer than thorax, and gradually widened posteriorly and abruptly narrowed near end; segments subequal in length; ovipositor sheaths about two-thirds length of abdomen, about 0.3 mm. Antennal scape subcylindrical; pedicel twice as long as wide at apex; ring segment about one-third length of pedicel; funicle segments subequal in length, slightly shorter than pedicel, and gradually increasing in width distad; club slightly wider than last funicle segment and as long as last two funicle segments combined. Wings uniformly ciliate except at base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 23: 25: 5: 5.

Length of body, 1.5 mm.

Holotype, female (BISHOP 3577), Tumon, Guam, Nov. 13, 1936, Swezey. Paratype (CM), Pati Point, Guam, June 4, 1945, Dybas.

DISTRIBUTION: S. Mariana Is. (Guam).

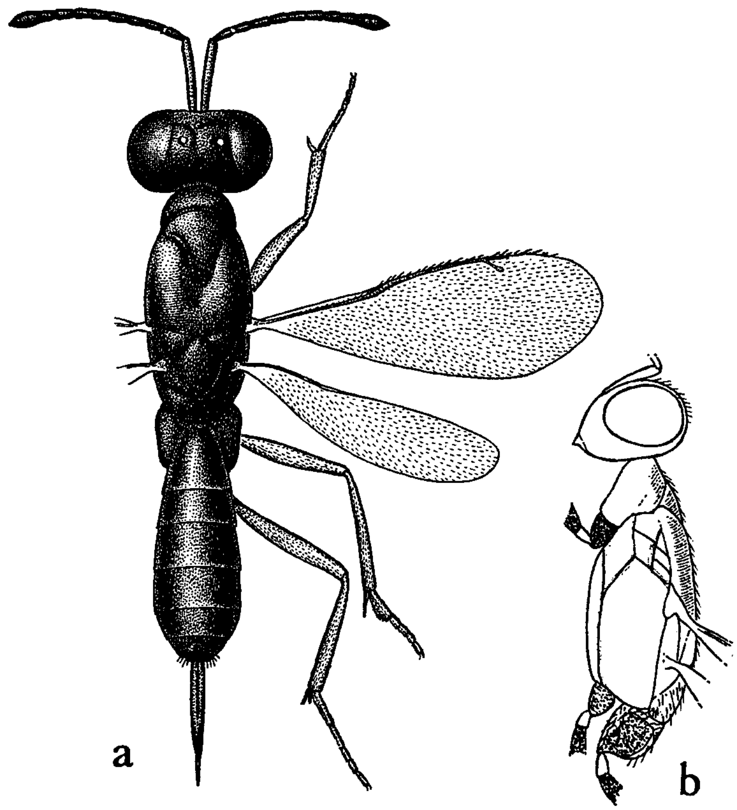


FIGURE 17.—*Eupelmus nigricoxus,* female: **a,** dorsal view; **b,** lateral view.

42. **Eupelmus microreticulatus** Yoshimoto and Ishii, n. sp. (fig. 18).

Female: Black with a greenish luster; antennae black; scape with a greenish luster; wings faintly clouded with veins pale yellowish brown; tegulae brown. Legs except coxae yellowish red; coxae black except tip yellowish red; last tarsal segment brown.

Head and thorax minutely reticulate; propodeum and abdomen shagreened.

Ovipositor sheaths pale brown in apical half and whitish in basal part except extreme base.

Eyes almost bare; frontovertex moderately broad; ocelli in an equilateral triangle, separated from inner eye margins by about one-half their own diameter. Antennae rather long; scape moderately expanded below; pedicel twice as long as wide at apex; ring segment short and a little wider than long; funicle 7-segmented and gradually widened distad; segments 1 to 3 subequal in length and a little longer than pedicel; segments 4 to 7 subequal in length and width, a little shorter than segment 3; club as wide as last funicle segment and nearly as long as preceding two funicle segments combined.

Mesoscutum depressed; parapsides with a longitudinally raised ridge; abdomen cylindrical and rounded at apex, about as long as head and thorax combined; segments subequal in length, except segment 2 shortest, 5 longest and about twice as long as 4. Ovipositor sheaths about one-half as long as abdomen, about 0.6 mm.

Wings uniformly ciliate except at base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 24: 46: 6: 7.

Holotype, female (US 67523), Mt. Lamlam, Guam, Oct. 1952, Krauss. Paratypes (BISHOP, US): Two females, Mt. Lamlam, Guam, Oct. 1957, Krauss; female, Pt. Ritidian, Guam, June 19, 1945, Bohart and Gressitt. Female, Tarawa Atoll, Teaoraereke, Gilbert Is., Nov. 1957, Krauss.

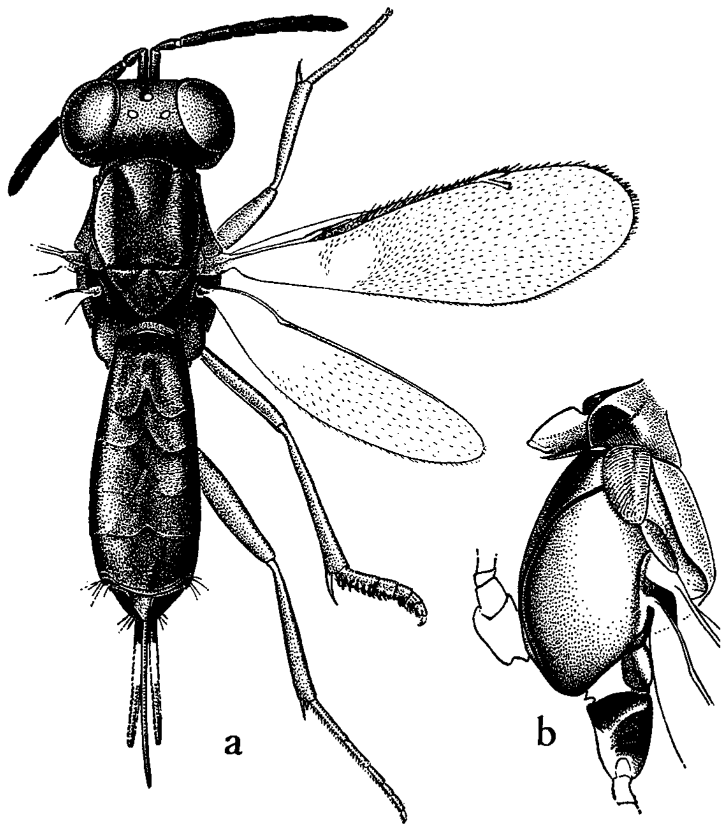


FIGURE 18.—*Eupelmus microreticulatus,* female: **a**, dorsal view; **b**, lateral view.

DISTRIBUTION: S. Mariana Is. (Guam), Gilbert Is. (Tarawa). This species is close to *E. chalcoprepes* Perkins.

43. Eupelmus carolinensis Yoshimoto and Ishii, n. sp. (fig. 19).

Female: Black with a bluish luster; antennae concolorous with body; wings hyaline with veins pale brown; tegulae black; fore legs black except apices of femora and tibiae pale yellowish brown; tarsi pale brown; middle legs black except extreme bases and apices of femora pale yellowish brown; hind tarsi whitish with terminal two segments dark brown. Ovipositor sheaths dark brown with tip pale.

Head, pronotum, and mesonotum reticulate; mesopleura reticulate, but anterior part more closely reticulate than posterior part; abdomen shagreened.

Head with moderately thick whitish hairs; frontovertex moderately broad; eyes bare; ocelli in an obtuse-angled triangle, posterior pair separated from inner eye margins by one-half their own diameter; scrobes rather shallow. Antennae moderately long; scape subcylindrical; pedicel twice as long as wide; ring segment one-third as long as pedicel; slightly wider than long; funicle 7-segmented, segments gradually decreasing in length; funicle segment 1 a little longer than pedicel and twice as long as wide; club slightly wider than last funicle segment and as long as last two funicle segments combined.

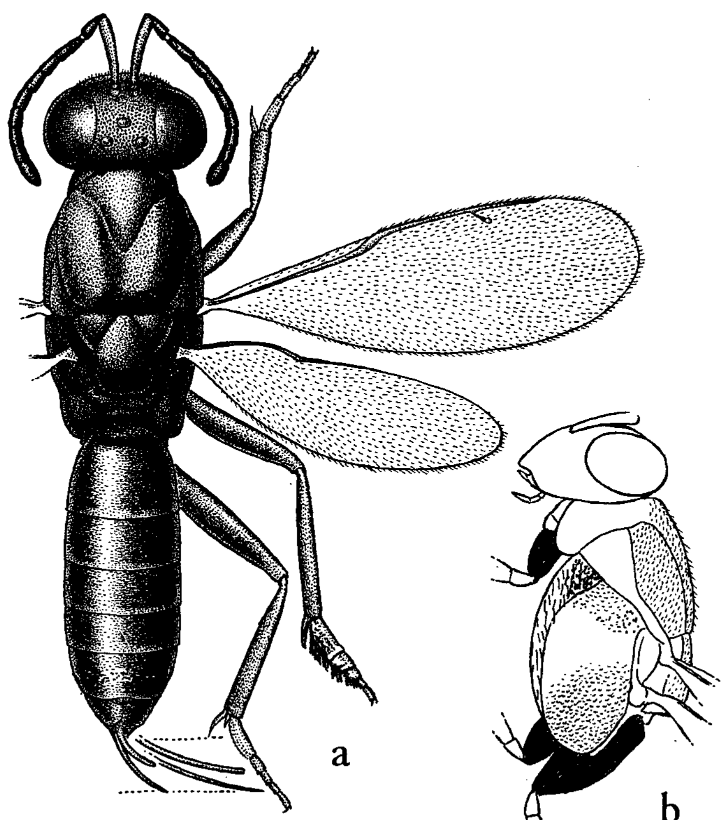


FIGURE 19.—*Eupelmus carolinensis,* female: **a,** dorsal view; **b,** lateral view.

Thorax and abdomen with sparse white hairs; mesoscutum depressed; parapsides longitudinally roundly raised, forming a slight ridge at base. Wings uniformly ciliate; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 30: 30: 5: 20. Abdomen conic ovate, about as long as head and thorax combined; segments subequal in length, but segment 1 longest; ovipositor sheaths a little longer than abdomen, about 1.5 mm. in length.

Length of body, 4.5 mm.

Holotype, female (BISHOP 3578), Koror I., Palau Is., Feb. 7, 1954, Beardsley. Paratype, female, Koror I., Palau Is., Sept. 1953, Beardsley.

DISTRIBUTION: Caroline Is. (Palau).

44. **Eupelmus guamensis** Yoshimoto and Ishii, n. sp. (fig. 20).

Female: Fuscous with a greenish luster; antennae brown; wings hyaline with veins pale brown; tegulae and legs dark brown except tibiae, tarsi, and apices of femora yellowish. Ovipositor sheaths dark brown except pale brown at middle.

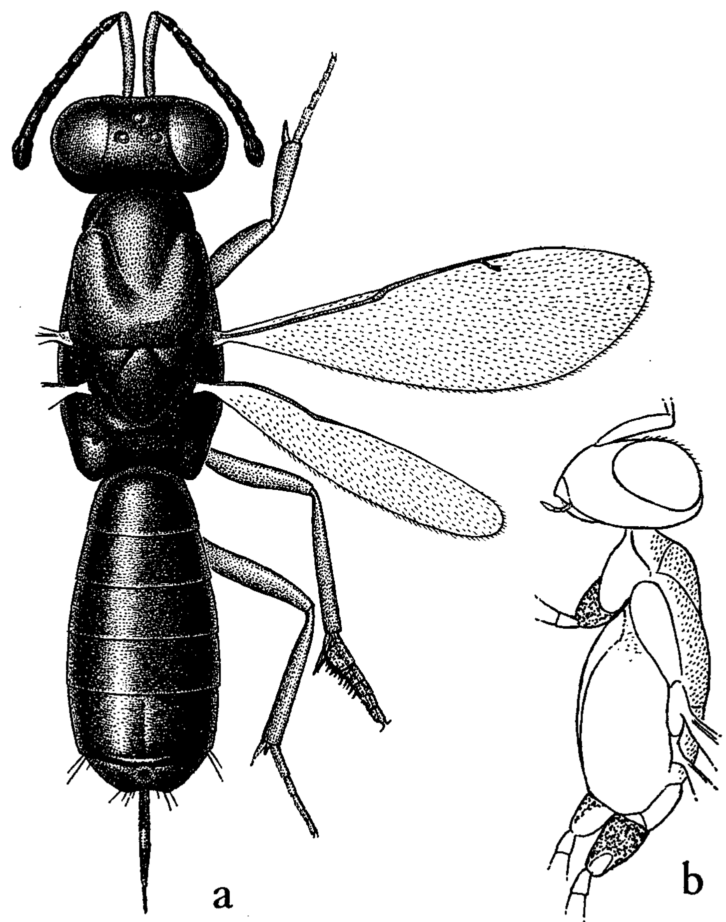


FIGURE 20.—*Eupelmus guamensis*, female: **a**, dorsal view; **b**, lateral view.

Head, pronotum, mesonotum, and mesopleurae shallow reticulate; abdomen shagreened.

Frontovertex moderately broad; eyes almost bare; ocelli in an obtuse-angled triangle, posterior pair separated from inner eye margins by one-half their own diameter. Antennal scape subcylindrical; pedicel twice as long as wide at apex; ring segment about one-third length of pedicel and slightly wider than long; funicle segments

subequal in length, a little shorter than pedicel, gradually increasing in width distad; club a little wider than last funicle segment and as long as last three funicle segments combined.

Mesoscutum depressed; parapsides longitudinally raised, not forming a keel; abdomen as long as head and thorax combined, and gradually widened posteriorly and abruptly narrowed near end. Ovipositor sheaths about one-third length of abdomen, about 0.3 mm.

Wings uniformly ciliate except at base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 20: 25: 5: 4.

Length of body, 1.5 mm.

Holotype, female (BISHOP 3579), Machanao, Guam, June 5, 1936, Usinger. Paratype (US), female, Pt. Ritidian, Guam, May 30, 1945, Gressitt.

DISTRIBUTION: S. Mariana Is. (Guam).

This species is closely allied to *E. swezeyi,* but it differs in the arrangement of the ocelli, and in the color of the legs and ovipositor sheaths.

45. Eupelmus viridiceps Yoshimoto and Ishii, n. sp. (fig. 21).

Female: Fuscous with a bluish reflection, but cheeks and mesoscutum with a greenish luster. Antennae black; wings hyaline with veins pale brown; legs pale yellowish red except coxae black. Ovipositor sheaths dark brown except for pale-brown tip.

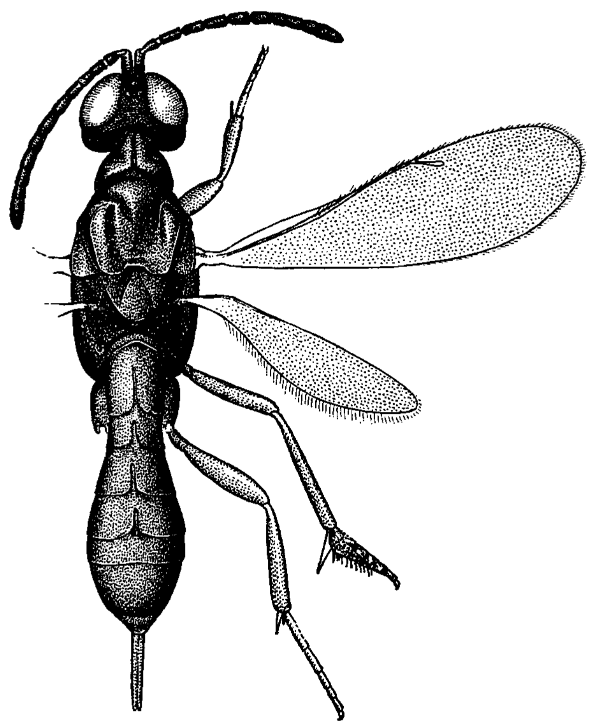


FIGURE 21.—*Eupelmus viridiceps,* female, dorsal view.

Head, thorax, and abdomen shagreened, but scutellum longitudinally scaly reticulate and mesoscutum almost smooth.

Frontovertex rather narrow; eyes almost bare; ocelli in an acute-angled triangle, posterior pair very near to inner eye margins; scrobes rather shallow. Antennae rather slender; scape subcylindrical; pedicel twice as long as wide at apex; ring segment about one-third length of pedicel and a little wider than long; funicle segments 1 to 4 subequal in length and funicle segment 1 as long as pedicel; funicle segments 5 to 7 slightly shorter and wider than 4; club slightly wider than last funicle segment and as long as last two funicle segments combined.

Mesoscutum depressed; parapsides longitudinally keeled at middle. Wings uniformly ciliate except at base; ratio of submarginal, marginal, stigmal, and postmarginal veins approximately 27: 20: 7: 12. Abdomen conic-ovate, as long as head and thorax combined; ovipositor sheaths two-thirds length of abdomen, about 0.3 mm.

Length of body, 1.5 mm.

Holotype, female (US 67524), Nahpali I., Ponape I., June-Sept. 1950, Adams. Paratypes (BISHOP, US): Female, same data as holotype, Adams. Female, Koror, Palau Is., Mar. 1954, May 1957, Malay apple foliage, Sabrosky; female, Angaur I., Palau Is., May 1, 1954, Beardsley; female, Ulimang, Babelthuap I., Palau Is., Dec. 15, 1947, Dybas; female, NW. Auluptagel, Palau Is., alt. 25 m., Dec. 13, 1952, Gressitt. Female, Yap, hill behind Yaptown, Nov. 28, 1952, Gressitt; female, Rumung I., June 17, 1957, Sabrosky. Two females, Mt. Temwetemwensekir, Ponape I., 150 m., Jan. 19, 1953, Gressitt.

DISTRIBUTION: Caroline Is. (Palau, Yap, Ponape).

46. **Eupelmus kororensis** Yoshimoto and Ishii, n. sp. (fig. 22).

Female: Fuscous; head with a bluish reflection; antennae and tegulae concolorous with body; wings hyaline with veins pale brown; legs pale yellowish red except coxae and femora black; apex of hind femora pale yellowish red. Ovipositor sheaths yellowish white except apical one-third and basal part black. Head and mesonotum with sparse silvery-white hairs.

Head and thorax rather deeply reticulate; abdomen shagreened; frontovertex moderately broad; eyes almost bare; ocelli in an obtuse-angled triangle, posterior pairs separated from inner eye margins by about their own diameter; scrobes rather shallow. Antennal scape subcylindrical; pedicel twice as long as wide at apex; ring segment about one-fourth length of pedicel; funicle segments subequal in length and gradually increasing in width distad and funicle segment 1 slightly shorter than pedicel; club a little wider than last funicle segment and nearly as long as preceding three funicle segments combined. Wings uniformly ciliate except at base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 20: 25: 6: 10. Abdomen conic-ovate, as long as thorax; ovipositor sheaths one-third length of abdomen, about 0.3 mm.

Length of body, 1.6 mm.

Holotype, female (BISHOP 3580), Koror, Palau Is., Feb.-July 1953, Beardsley. Paratypes (BISHOP, US), nine females, same data as holotype.

DISTRIBUTION: Caroline Is. (Palau).

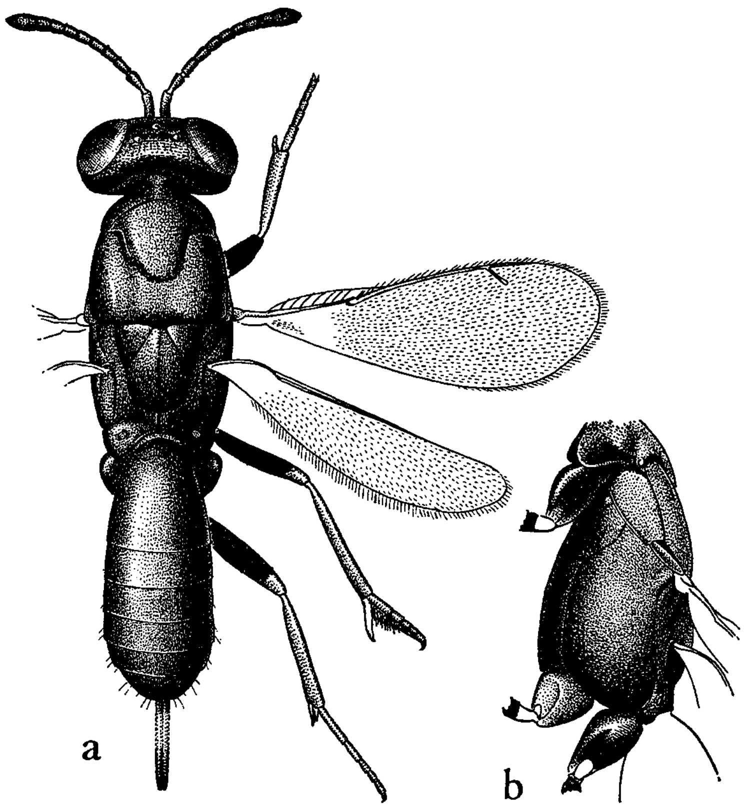


FIGURE 22.—*Eupelmus kororensis,* female: **a**, dorsal view; **b**, lateral view.

47. Eupelmus boharti Yoshimoto and Ishii, n. sp.

Female: Black with a greenish luster, but frontovertex with a bluish luster; antennae black; wings hyaline with veins pale brown; legs yellowish brown except coxae dark brown.

Frontovertex reticulate; cheeks shagreened; thoracic notum and mesopleura reticulate, latter almost smooth at posterior third; abdomen shagreened except segment 6 reticulated.

Frontovertex rather broad with a distinct furrow anterior of ocellus; sides of furrow serrated. Ocelli in an obtuse-angled triangle, posterior pair very near inner eye margins.

Antennae inserted at middle of face and rather slender; scape subcylindrical; pedicel twice as long as wide at apex; ring segment short and wider than long; funicle segments gradually decreasing in length distad, segment 1 a little more than twice as long as pedicel; club as wide as and a little shorter than last funicle segment.

Mesoscutum depressed; axillae considerably separated. Fore wings uniformly ciliate except basal part below submarginal vein; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 20: 18: 3: 10. Hind wings also uni-

formly ciliate except at base. Legs slender; abdomen lanceolate and pointed toward apex; segments subequal in length. Ovipositor sheaths scarcely produced.

Length of body, 1.5 mm.

Holotype, female (US 67525), Alamagan, N. Mariana Is., July 28, 1951, Bohart. Paratype, female, Agrihan I., N. Mariana Is., July 26, 1951, Bohart.

DISTRIBUTION: N. Mariana Is. (Alamagan, Agrihan).

Genus **Anastatus** Motschulsky

Anastatus Motschulsky, 1859, Etudes Ent. **8**: 116 (type: *Anastatus mantoidae* Motschulsky; monobasic).—Peck, 1963, Canadian Ent., Suppl. **30**: 497-504.

Key to Species of Micronesian Anastatus

1. Ovipositor sheaths one-fifth length of abdomen; parapsides raised but not forming a keel posteriorly .... **48. kraussi**
   Ovipositor sheaths much longer than abdomen; parapsides raised, forming a keel posteriorly 2
2. Legs brownish yellow .... **51. picticornis**
   Legs black or brownish with patches of yellow 3
3. Basal three segments of hind tarsi yellowish white .... **50. adamsi**
   Basal and apical segments of hind tarsi black .... **49. crassipes**

48. **Anastatus kraussi** Yoshimoto and Ishii, n. sp. (fig. 23, *a*).

Female: Black with a greenish-blue reflection. Frontovertex, anterior part of mesoscutum, and scutellum with a greenish reflection; lower part of face, parapsides, propodeum, mesopleura, and abdomen with a bluish reflection. Antennae black with greenish luster; tegulae black; fore wings hyaline with a broad transverse fuscous band at middle and basal part just below marginal vein paler. Hind wings hyaline; veins of wings pale brown. Legs dark brown except all tarsi pale yellowish white. Ovipositor sheaths brown.

Head shagreened except for frontovertex and face minutely reticulate. Thorax shagreened, but middle part of scutum and scutellum minutely reticulate; axillae longitudinally scaly reticulate; abdomen shagreened.

Frontovertex rather narrow; eyes with sparse hairs; cheeks with rather thick silvery hairs; ocelli in an acute-angled triangle, posterior pair very near inner eye margins; scrobes rather deep, reaching just below anterior ocellus. Antennae slender and rather long; scape long and subcylindrical; pedicel nearly three times as long as wide at apex; ring segment slightly longer than wide and one-third length of pedicel; funicle segments 1 to 4 subequal in length and width, much longer than pedicel, and three times as long as wide; funicle segments 5 and 7 a little shorter than 4 and gradually decreasing in length and increasing in width; club differentiated, a little wider than last funicle segment and as long as preceding three segments combined.

Mesoscutum depressed; parapsides longitudinally raised but not forming a keel; axillae separated. Fore wings densely ciliate except hyaline part; marginal vein with thick hairs; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 30: 26: 8: 10.

Abdomen a little longer than thorax and gradually widening posteriorly and abruptly narrowed near apex. Ovipositor sheaths about one-fifth length of abdomen, about 0.2 mm.

Length of body, 1.5 mm.

Holotype, female (US 67526), Talofofo, Guam, Aug. 1952, Krauss.
DISTRIBUTION: S. Mariana Is. (Guam).

49. Anastatus crassipes Yoshimoto and Ishii, n. sp. (fig. 23, *b, c*).

Female: Black with a little bluish luster. Antennae black except scape and pedicel reddish brown; palpi brown; tegulae black; fore wings infuscated except basal part just below submarginal vein pale brown; hind wings hyaline; veins brown except

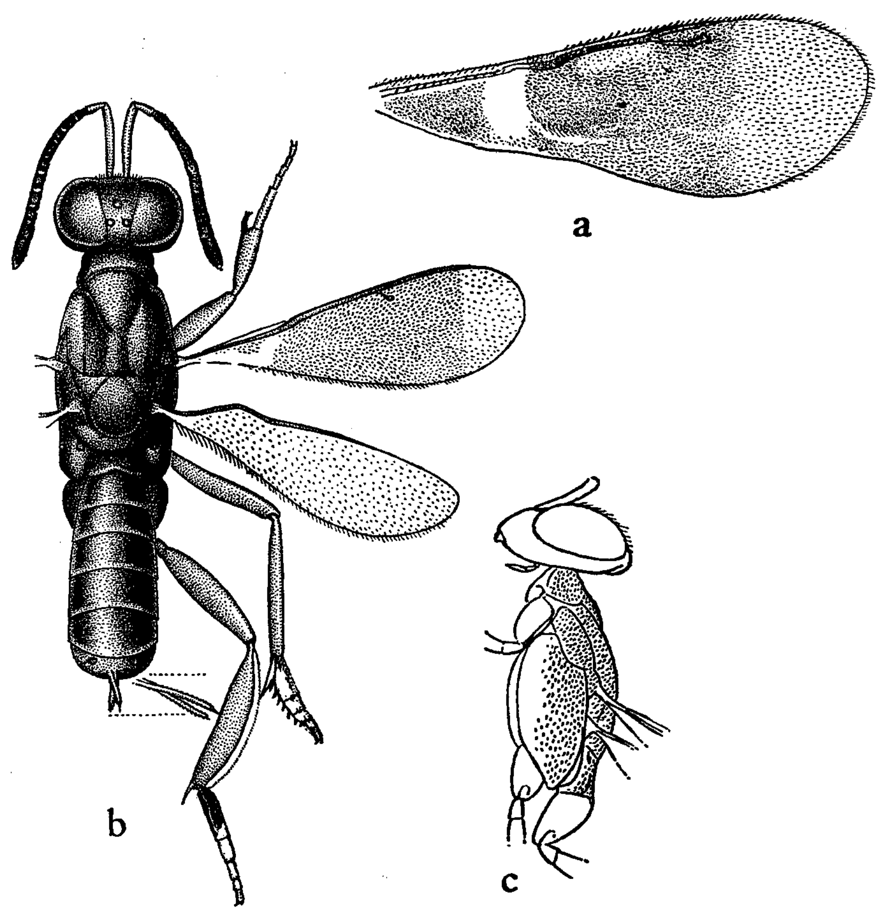


FIGURE 23.—a, *Anastatus kraussi*, female, wing. b, c, *A. crassipes*, female: *b*, dorsal view; *c*, lateral view.

submarginal vein pale brown. Legs concolorous with body in general; tarsi pale yellowish brown, but basal and apical segments of hind tarsi black; ventral part of base of abdomen pale yellowish brown. Ovipositor sheaths brown, near tip dark brown.

Head and thorax minutely reticulate; mesopleura longitudinally strio-reticulate and anterior half more coarsely striate; abdomen shagreened.

Frontovertex rather narrow, converging posteriorly; face with scalelike hairs; eyes with sparse hairs; ocelli in an acute-angled triangle, posterior pair very near to inner eye margins; scrobes shallow.

Antennae moderately strong; scape subcylindrical and rather long; pedicel a little more than twice as long as wide at apex; ring segment short, wider than long; funicle segments subequal in length, increasing in width distad, funicle segments a little

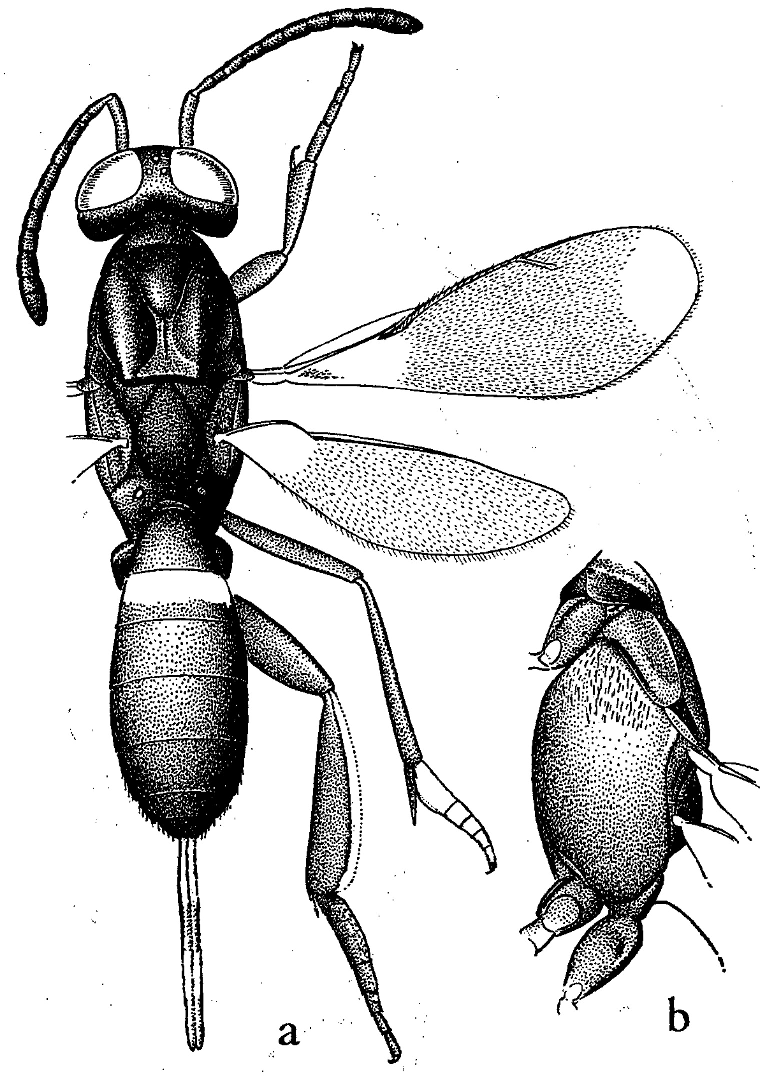


FIGURE 24.—*Anastatus adamsi,* female: **a,** dorsal view; **b,** lateral view.

shorter than pedicel; funicle segment 1 a little longer than wide, last funicle segment a little wider than long; club as wide as last funicle segment and as long as preceding two funicle segments combined.

Mesoscutum depressed; parapsides elevated, forming a keel posteriorly; axillae considerably separated.

Fore wings densely ciliate except rather sparsely ciliate at base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 25: 33: 10: 20. Hind wings uniformly ciliate, but densely at base.

Abdomen almost as long as thorax and gradually widening posteriorly. Ovipositor sheaths much longer than abdomen.

Legs rather stout, especially hind femora very stout; tibiae and first tarsal segment of hind legs considerably dilated.

Length of body, 2.6 mm.

Holotype, female (BISHOP 3581), Koror, Palau Is., Jan. 1954, Beardsley. Paratypes (BISHOP, US): Four females, Koror, Palau Is., Dec. 1952, Beardsley; female, Ngerehelong, Babelthuap, Sept. 9, 1953, Beardsley.

DISTRIBUTION: Caroline Is. (Palau).

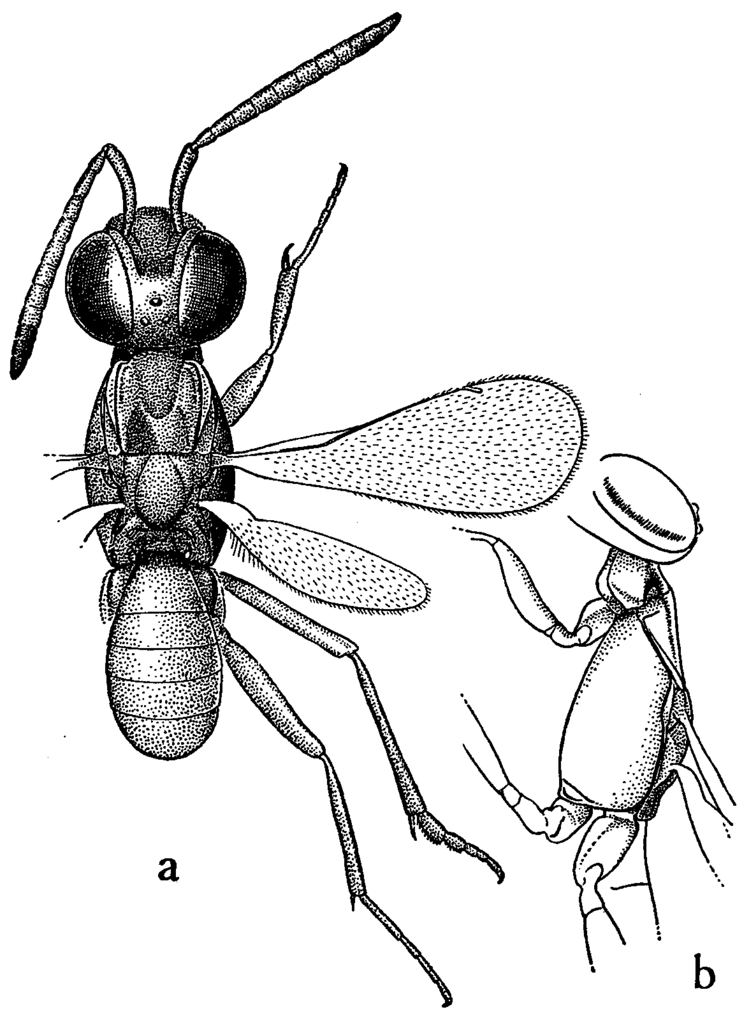


FIGURE 25.—*Anastatus picticornis*, female: **a**, dorsal view; **b**, lateral view.

50. Anastatus adamsi Yoshimoto and Ishii, n. sp. (fig. 24).

Female: Legs black except basal three segments of hind tarsi yellowish white; hind tibiae yellowish white on dorsal margin; ovipositor tricolored, pale brown in basal two-thirds and darker distad, apical third yellowish white and apex dark brown. In the specimen from Yap I., scape and pedicel dark brown and abdominal segment 1 pale brown at apical margin.

Length of body, 1.5 mm.

Holotype, female (US 67527), Net Point, Ponape I., June-Sept. 1950, Adams. Paratype, female, Yap Group, July-Aug. 1950, Goss.

DISTRIBUTION: Caroline Is. (Yap, Ponape).

This species is closely allied to *A. crassipes* but may be distinguished by the coloration of legs and ovipositor and much smaller size.

51. Anastatus picticornis (Cameron) (fig. 25).

Solindenia picticornis Cameron, 1883, Ent. Soc. London, Trans., 189, female.

Solindenia picticornis: Dalla Torre, 1898, Cat. Hym. **5**: 271.

Solindenia picticornis: Ashmead, 1901, Fauna Hawaiiensis **1** (3): 314.

Anastatus picticornis: Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 213.

DISTRIBUTION: S. Mariana Is.

S. MARIANA IS. GUAM: Three females, Piti, July 1936, Swezey; female, Piti, May 1936, Usinger; Piti Pt., June 1945, Dybas.

Timberlake (1926) reported that *A. picticornis* is a parasite of egg capsules of *Allacta similis* (Saussure) (Blattidae).

Genus **Merostenus** Walker

Merostenus Walker, 1837, Ent. Mag. **4**: 354 (type: *Merostenus phedyma* Walker = *Eupelmus excavatus* Dalman; monobasic).—Peck, 1963, Canadian Ent., Suppl. **30**: 506-507.

Eupelminus Dalla Torre, 1897, Wiener Ent. Zeitung **16**: 85.

KEY TO SPECIES OF MICRONESIAN MEROSTENUS

1. Ovipositor sheaths not produced .... **54. ferrugineus**
   Ovipositor sheaths a little shorter than one-half length of abdomen 2
2. Body black with bluish luster; funicle segments 5 and 6 of antennae whitish.......... **53. palauensis**
   Body yellowish brown in general; antennae dark brown.......... **52. guamensis**

52. Merostenus guamensis Yoshimoto and Ishii, n. sp. (fig. 26).

Female: Yellowish brown in general; frontovertex brown with a green reflection; palpi pale yellowish white; mandibles dark brown; antennae dark brown except scape yellowish brown; lower part of mesopleura brown; legs yellowish brown except hind tibiae whitish yellow. Wings hyaline with veins pale yellowish brown. Abdomen brown except apical part yellowish brown. Ovipositor pale whitish yellow with brown tip.

Head and body minutely shagreened; mesopleura longitudinally striate.

Frontovertex moderately broad; eyes with sparse hairs; ocelli in an obtuse-angled triangle, posterior pair separated from inner eye margins by their own diameter; scrobes shallow.

Antennae rather stout; scape stout and considerably dilated below; pedicel nearly twice as long as wide at apex; ring segment one-half as long as pedicel and slightly

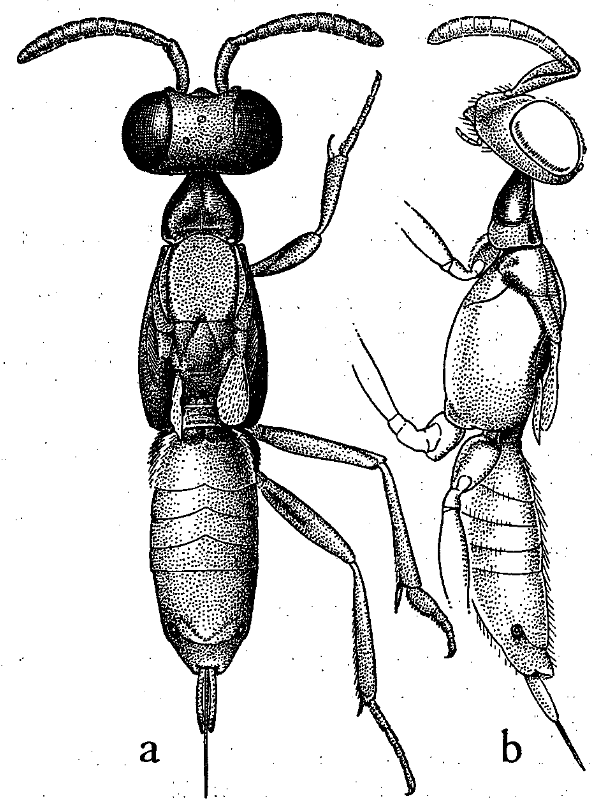


FIGURE 26.—*Merostenus guamensis*, female: **a**, dorsal view; **b**, lateral view.

wider than long; funicle segments subequal in length and increasing in width distad, funicle segment 1 somewhat longer, and slightly longer than pedicel; club as wide as last funicle segment and as long as preceding two funicle segments combined.

Mesoscutum a little depressed; axillae a little separated; wings degenerated and very small; veins of fore wings with about six bristles. Abdomen long ovate and as long as thorax, and with brown hairs. Ovipositor sheaths short and about one-half length of abdomen. Legs rather slender.

Length of body, 1.5 mm.

Holotype, female (US 67528), Guam, Mar. 30, 1948, Dybas. Paratypes (BISHOP): Female, Piti, Guam, Aug. 13, 1936, Swezey; female, Barrigada, Guam, June 12, 1936, Swezey.

DISTRIBUTION: S. Mariana Is. (Guam).

53. Merostenus palauensis Yoshimoto and Ishii, n. sp. (fig. 27).

Female: Black with a bluish luster; cheeks reddish brown; sides of mesoscutum, axillae, and scutellum brown; antennae black except funicle segments 5 and 6 which

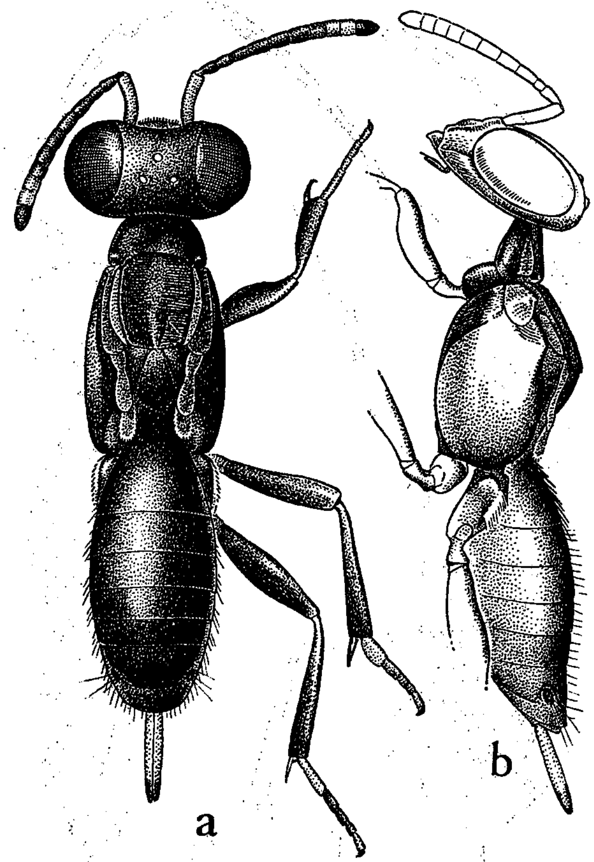


FIGURE 27.—*Merostenus palauensis,* female: **a,** dorsal view; **b,** lateral view.

are whitish; scape brown. Fore wings clouded; legs black, except middle leg at middle and basal tarsal segments whitish; hind tarsi with segments 2 and 3 dark brown and segments 4 and 5 brownish white; fore tarsi brownish yellow. Ovipositor sheaths pale yellowish brown and darker toward tip.

Frontovertex rather broad; legs with sparse hairs; ocelli in an obtuse-angled triangle, posterior pair separated from inner eye margins by their own diameter; scrobes shallow.

Antennae moderately long; scape subcylindrical; pedicel a little more than twice as long as wide at apex; ring segment a little less than one-half length of pedicel; funicle segments gradually increasing in width and decreasing in length distad, funicle segment 1 longest and as long as pedicel, and last funicle segment slightly wider than long; club as wide as last funicle segment and as long as preceding two funicle segments combined.

Mesoscutum depressed and both sides keeled, forming flaplike projections posteriorly; axillae a little separated. Wings degenerated, fore wings ribbon-like. Abdomen long oblong, as long as head and thorax combined and with sparse brown and grayish hairs. Ovipositor sheaths a little shorter than one-half length of abdomen.

Length of body, 1.6 mm.

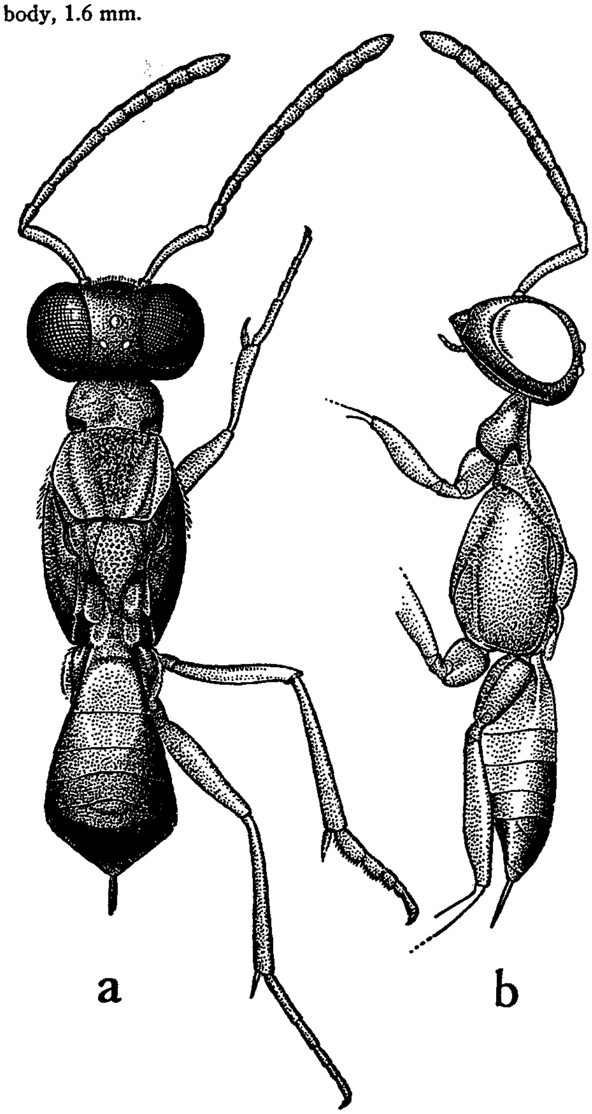


FIGURE 28.—*Merostenus ferrugineus*, female: **a**, dorsal view; **b**, lateral view.

Holotype, female (US 67529), Koror I., Palau Is., Jan. 21, 1948, Dybas. Paratype, female (BISHOP), Koror I., Palau Is., Dec. 14, 1952, Gressitt.

DISTRIBUTION: Caroline Is. (Palau).

54. **Merostenus ferrugineus** Yoshimoto and Ishii, n. sp. (fig. 28).

Female: Reddish-brown in general, but head and abdomen dark brown and latter pale at base. Legs reddish brown, but hind tarsi paler; antennae dark brown except scape and pedicel which are reddish brown. Wings hyaline.

Frontovertex moderately broad; eyes with sparse hairs; ocelli in an equilateral triangle, posterior pair very near to inner eye margins; scrobes shallow.

Antennae rather slender and long; scape long and subcylindrical; pedicel twice as long as wide at apex; ring segment a little less than one-half length of pedicel and a little wider than long; funicle segments slightly increasing in width and decreasing in length distad, but segments 1 to 3 subequal and considerably longer than pedicel; club slightly wider than last funicle segment and as long as preceding two funicle segments combined.

Head and body shagreened; mesopleura longitudinally scaly reticulate; frontovertex, mesoscutum, axillae and scutellum minutely reticulate. Pronotum produced anteriorly and nearly as long as thorax and with sparse hairs; legs rather slender; ovipositor sheaths not produced.

Length of body, 1.5 mm.

Holotype, female (BISHOP 3582), Upi Trail, Guam, May 5, 1936, Swezey. Paratypes (BISHOP, US): Female, Upi trail, Guam, May 5, 1936, Swezey; female, Mt. Santa Rosa, May 19, 1936, Swezey; female, Yona, Guam, Nov. 18, 1936, Swezey; Pt. Ritidian, Guam, female, Apr. 16, 1936, Bryan, female, June 2, 1945, Gressitt; five females, Guam, 1911, Fullaway.

DISTRIBUTION: S. Mariana Is. (Guam).

FAMILY PTEROMALIDAE

This family is one of the largest in the Chalcidoidea and certainly one of the largest groups known from Micronesia. Represented in Micronesia are three subfamilies, Spalangiinae (one genus, three species), Diparinae (one genus, one species), Miscogasterinae (one genus, four species), and Pteromalinae (eight genera, nine species). All genera are worldwide in distribution. Eight species are new to Micronesia and the remaining nine are introduced. The life history and biology of *Moranila californica* (Howard) and *Sphegigaster rugosa* Waterston are well known.

The family Pteromalidae is separated from other families by the following combination of characters: five tarsal segments, pronotum indistinct, antenna 12- to 13-segmented, hind tibia with one apical spur, head often wider than thorax, and generally metallic in color.

KEY TO SUBFAMILIES OF MICRONESIAN PTEROMALIDAE

1. Antenna without ring segments; body sculptured or punctate; non metallic...... .... **Spalangiinae**
   Antenna with one or more ring segments; body reticulate and metallic........ 2
2. Head and thorax mostly yellowish, with regularly spaced long bristles; antenna with one ring segment, seven funicle segments........ **Diparinae**
   Head and thorax usually metallic; antenna with two or more ring segments, six funicle segments........ 3
3. Abdomen petiolate or subpetiolate........ **Miscogasterinae**
   Abdomen sessile or subsessile........ **Pteromalinae**

SUBFAMILY SPALANGIINAE

Genus **Spalangia** Latreille

Spalangia Latreille, 1805, Hist. Nat. Crust. Ins. **13**: 227 (type: *Spalangia nigra* Latreille, monobasic).—Peck, 1963, Canadian Ent., Suppl. **30**: 596-599.—Bouček, 1963, Acta Ent. Mus. Nat. Prag. **35**: 429-512.

Bouček (1963) presented an excellent revision of the genus *Spalangia* Latreille and included illustrations, descriptions, new synonymy, host parasite list, and keys to species. The genus *Spalangia* is known to be a parasite of Diptera, Lepidoptera, and Hymenoptera.

KEY TO SPECIES OF MICRONESIAN SPALANGIA

1. Face and vertex with close-set, large punctures........ **56. nigra**
   Face and vertex with more widely separated, smaller punctures........ 2
2. Pronotum semiglobose, polished, and punctures widely separated........ **57. endius**
   Pronotum less arched, densely rugose punctate........ **55. cameroni**

55. Spalangia cameroni Perkins.

Spalangia cameroni Perkins, 1910, Fauna Hawaiiensis 2 (6): 656.—Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 213.—Lever, 1934, Trop. Agric. **11**: 37.—Bouček, 1963, Acta Ent. Mus. Nat. Prag. **35**: 454-457.

DISTRIBUTION: Europe, Africa, India, Malaya, Central and South America, Fiji, Hawaii, S. Mariana Is.

Timberlake (1924, Hawaiian Ent. Soc., Proc. **5**: 426) notes that this species is a parasite of many species of Diptera, including *Stomoxys, Lyperosia, Sarcophaga, Limnophora,* and *Dacus.*

56. Spalangia nigra Latreille.

Spalangia nigra Latreille, 1805, Hist. Nat. Crust. Ins. **13**: 228.—Bouček, 1963, Acta Ent. Mus. Nat. Prag. **35**: 443-448.

DISTRIBUTION: Europe, North America, Peru, Australia, New Zealand, S. Mariana Is.

S. MARIANA IS. GUAM: Two males, Piti, May, Sept. 1936, Swezey; male, Pt. Ritidian, June 1945, Bohart and Gressitt; male, Agana Spring, May 1945, Bohart and Gressitt.

57. Spalangia endius Walker.

Spalangia endius Walker, 1839, Monogr. Chalc. 2: 57.—Bouček, 1963, Acta Ent. Mus. Nat. Prag. **35**: 458-461.

Spalangia philippinensis Fullaway, 1917, Hawaiian Ent. Soc., Proc. 3: 292.

DISTRIBUTION: Australia, New Caledonia, Fiji, Philippines, Hawaii, India, Samoa, Africa, North and South America, S. Mariana Is., Caroline Is.

S. MARIANA IS. GUAM: Male, Machanao, Aug. 1936, ex *Piper guamensis,* Swezey.

PONAPE. Female, Colonia, Ponape I., June-Sept. 1950, Adams.

SUBFAMILY DIPARINAE

Genus Dipara Walker

Dipara Walker, 1833, Ent. Mag. 1: 371, 373.—Peck, 1963, Canadian Ent., Suppl. **30**: 605-606.

58. Dipara palauensis Yoshimoto and Ishii, n. sp. (fig. 29).

Female: Yellowish brown in general, posterior half of mesonotum metallic blue black. Scape and pedicel yellowish brown; funicle segments brown; club whitish. Fore wing hyaline with two transverse pale-brown bands, basal band just below basal half of marginal vein and apical band just below stigmal vein; veins pale brown. Hind wings hyaline with veins pale brown. Legs yellowish brown.

Head as wide as thorax and wider than deep (25: 20); face scaly reticulate; frontovertex one-half as wide as head; scrobes shallow; occipital margin distinct. Antennae about 0.64 mm.; scape cylindrical; pedicel twice as long as wide at apex; ring segment very short; funicle segments cylindrical, 7-segmented, segment 1 as long as pedicel, following segments gradually decreasing in length distad, last segment a little wider than long; club 2-segmented, slightly wider than last funicle segment, segment 1 a little shorter than segment 2. Eyes with moderately fine pubescence; three pairs of bristles on frontovertex, two pairs just beside inner eye margins and one pair on occipital margin.

Pronotum much narrower than mesoscutum, scaly reticulate and with two pairs of bristles on posterior margin; mesoscutum with complete parapsidal furrows and scaly reticulate and with two pairs of bristles near posterior margin; scutellum nearly round and with transverse furrow at middle, scaly reticulate except part behind furrow striated and with two pairs of long bristles; axillae widely separated; propodeum produced into cylindrical neck at apex, smooth and with a median carina divided near base so as to form a triangular area.

Fore wings uniformly ciliate except at base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 15: 20: 5: 10; submarginal vein with four rather long bristles; marginal vein with about 18 bristles. Hind wings uniformly ciliate except basal part.

Abdomen as long as head and thorax combined; petiole cylindrical, twice as long as wide, much shorter than hind coxae and longitudinally strio-reticulate. Abdominal segments smooth; segment 2 very long, occupying nearly half length of abdomen excluding terminal pointed segments; other segments except last segment much shorter than segment 2 and subequal in length, last segment long and pointed. Ovipositor slightly produced.

Length of body, 1.1 mm.

Holotype, female (US 67533), Ngerchelong, Babelthuap I., Palau, Dec. 18, 1947, Dybas. Paratype female (BISHOP), Mt. Unibot, Ton I., Truk, Feb. 4, 1953, Gressitt.

DISTRIBUTION: Caroline Is. (Palau, Truk).

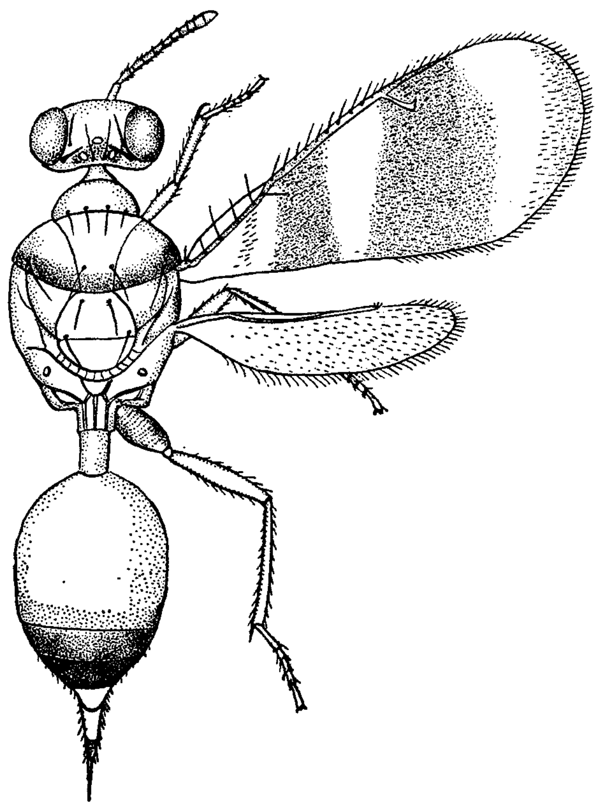


FIGURE 29.—*Dipara palauensis*, female.

SUBFAMILY MISCOGASTERINAE

Genus **Sphegigaster** Spinola

Sphegigaster Spinola, 1811, Mus. Hist. Nat. Paris, Ann. **17**: 149 (type: *Diplolepis pallicornis* Spinola). Designated by Ashmead, 1904, Carnegie Mus., Mem. **1** (4): 330.

KEY TO SPECIES OF MICRONESIAN SPHEGIGASTER

1. Head and thorax metallic green .... **60. rugosa**
   Head and thorax black with greenish or bluish reflection 2
2. Scutellum with deep, wide reticulation; abdomen brownish yellow .... **61. trukensis**
   Scutellum smooth, semi polished; abdominal segments largely smooth 3
3. Petiole short, 1.5 times as long as wide .... **62. yapensis**
   Petiole slender, 3 times as long as wide .... **59. burksi**

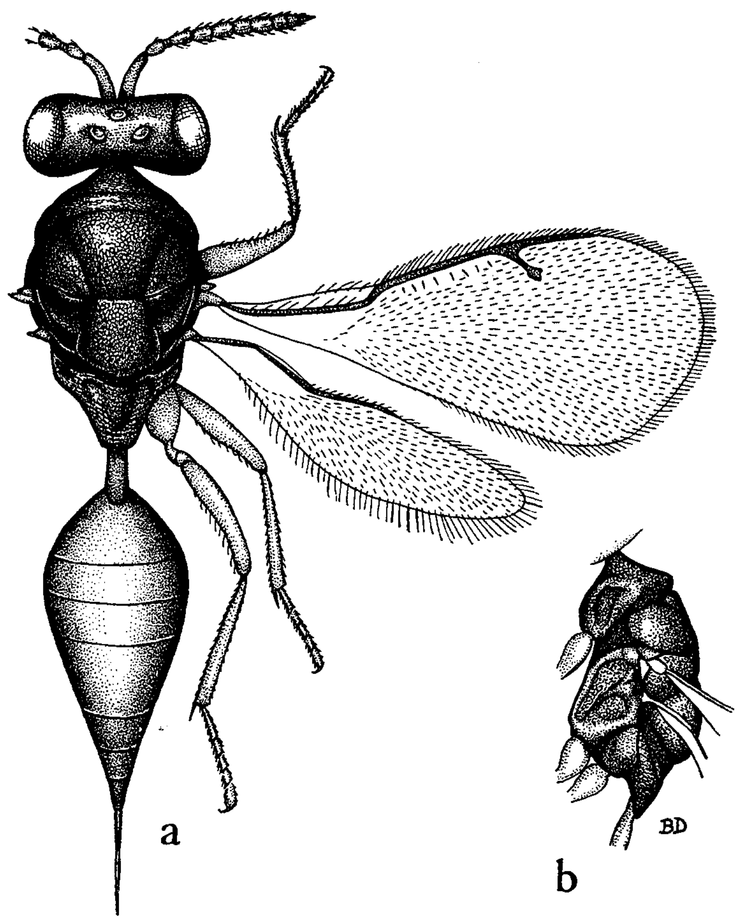


FIGURE 30.—*Sphegigaster burksi,* female: **a,** dorsal view; **b,** lateral view.

59. Sphegigaster burksi Yoshimoto and Ishii, n. sp. (fig. 30).

Female: Black with bluish luster; antennae black except scape and pedicel pale yellowish brown; tegulae pale yellowish brown; wings hyaline with veins pale yellowish brown. Legs yellowish; petiole yellowish brown; ovipositor sheaths dark brown.

Head and thoracic notum shallow shagreened; frontovertex and parapsides nearly smooth; mesopleura shallow reticulate; propodeum transversely strio-reticulate; abdomen nearly smooth.

Antennal scape cylindrical; pedicel a little longer than wide at apex; two small ring segments; funicle segments subequal in length and width, funicle segment 1 a little longer than wide; club as wide as the last funicle segment and a little longer than the last two funicle segments combined.

Mesoscutum with the parapsidal furrows distinct; scutellum rounded at apex; propodeum narrowed toward posterior end forming a neck, without median or lateral carinae. Abdominal petiole a little longer than hind coxae; abdomen as long as head and thorax combined, conic-ovate and pointed toward apex, segments subequal in length; ovipositor sheaths a little produced, about one-eighth length of abdomen. Legs normal.

Fore wings uniformly ciliate except base below submarginal vein; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 20: 13: 5: 13. Hind wings uniformly ciliate except at base.

Length of body, 1.2 mm.

Holotype, female (US 67530), Nanipil, Net Distr., Ponape I., Jan. 25, 1948, Dybas.

DISTRIBUTION: Caroline Is. (Ponape).

The generic reference for the single female described above is uncertain. This unique specimen probably represents a new genus, but until more specimens are collected, I am temporarily placing it in *Sphegigaster*.

60. Sphegigaster rugosa (Waterston).

Trigonogastra rugosa Waterston, 1915, Bull. Ent. Research **5**: 326.—Mani, 1938, Cat. Indian Insects (23): 105.

DISTRIBUTION: India, Ceylon, Philippines, Indonesia, Caroline Is.

CAROLINE ATOLLS: SONSOROL: Sept. 1952, Krauss. PULO ANNA: Sept. 1952, Krauss.

According to Dr. Burks, who identified the Micronesian specimens, *S. rugosa* occurs in the southwest Pacific as far as India and Ceylon. It is a parasite of *Melanagromyza phaseoli* (Malloch).

61. Sphegigaster trukensis Yoshimoto and Ishii, n. sp. (fig. 31).

Female: Legs entirely yellowish; abdominal segment 1 brown in some specimens; antennae slender and long; scape slender and cylindrical; pedicel a little longer than wide at apex; ring segments and funicle segments subequal in length and width, funicle segment 1 a little longer than pedicel and the last funicle segment slightly shorter than other segments; club as wide as last funicle segment and a little shorter than distal three funicle segments combined.

Abdominal petiole much shorter than hind coxae; abdominal segment 1 as long as segment 2 and together as long as one-half length of abdomen; other segments subequal in length; ovipositor sheaths short, about one-seventh length of abdomen.

Length of body, 1.2 mm.

Male: Similar to female in general, but differs in the antennae which are very long with long pale hairs except on scape and pedicel; scape yellowish brown, long and cylindrical; pedicel brown, as long as wide at apex; two small ring segments, funicle 8-segmented, black, subequal in length and width, segment 1 slightly more than three times as long as pedicel; club 2-segmented, as wide as the last funicle segment and a little shorter than last two funicle segments combined. Most of abdominal segments 1 and 2 yellowish brown.

Length of body, 1.2 mm.

Holotype, female (US 67531), Nama I., near Truk, Caroline Is., Feb. 15, 1949, Potts; allotype, male (BISHOP 3616), Kolonia, Yap, Caroline Is., Mar. 20-25, 1954, Beardsley. Paratypes: Female, same data as holotype; female, Etal Atoll, Nov. 2, 1952, Beardsley; male, female, Yap Group, July-Aug. 1950, Goss; female, Yap I., Yap Group, Oct. 1952, Krauss; female, Olei, Babelthuap, Palau I., May 23-24, 1953.

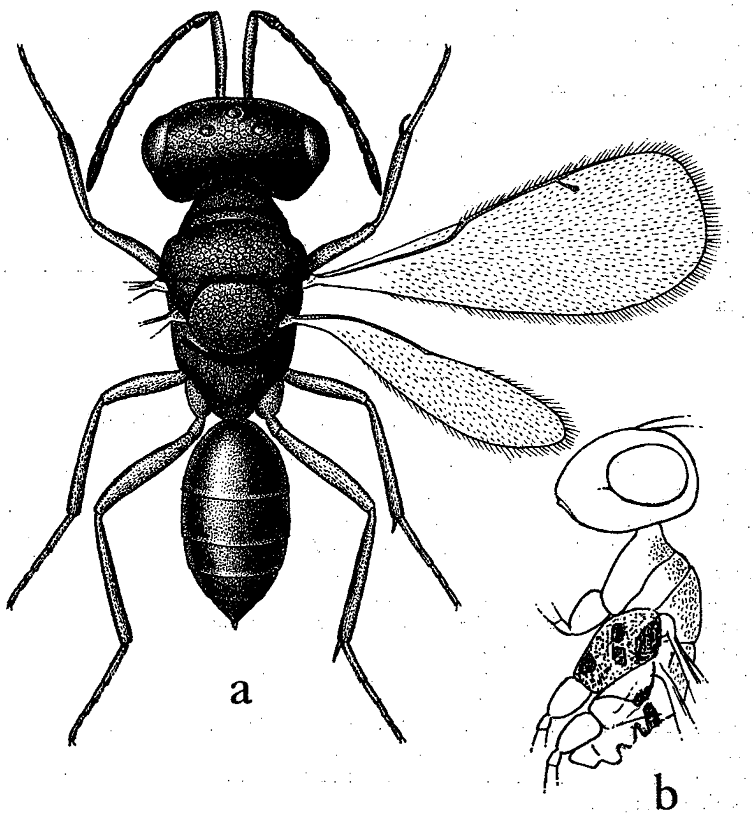


FIGURE 31.—*Sphegigaster trukensis*, female: **a**, dorsal view; **b**, lateral view.

DISTRIBUTION: Caroline Is. (Palau, Yap, Etal, Truk).
This species is allied to *S. rugosa* (Waterston).

62. Sphegigaster yapensis Yoshimoto and Ishii, n. sp.

Female: Black with a greenish luster except abdomen brown, yellowish at basal two-thirds. Antennae brown except scape yellowish brown. Wings hyaline with veins pale brown; tegulae yellowish brown. Legs yellowish brown except coxae black.

Head and thoracic notum minutely reticulate; mesopleura shallow reticulate; propodeum minutely reticulate and without median and lateral carinae. Abdominal

petiole as long as hind coxae, cylindrical, and minutely reticulate. Abdomen ovate, almost smooth, and segments decreasing in length toward apex, segment 1 longest. Ovipositor sheaths slightly produced.

Wings uniformly ciliate except at base; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 10: 10: 5: 7.

Frontovertex broad; ocelli in an obtuse-angled triangle, posterior pair separated from inner eye margins by twice their own diameter; scrobes shallow. Antennae rather short; scape cylindrical; pedicel a little longer than wide at apex; three ring segments, the distal segment slightly longer than preceding segments; funicle segments subequal in length and width, segment 1 slightly longer than wide, nearly as long as pedicel; club as wide as preceding segment, and as long as distal two funicle segments combined.

Length of body, 1 mm.

Holotype, female (US 67532), Kolonia, Yap, Yap Is., July-Aug. 1950, Goss.

DISTRIBUTION: Caroline Is. (Yap).

This species is allied to *S. trukensis*, n. sp., but it may be distinguished by the much longer abdominal petiole and ovate abdomen with segments subequal in length.

Subfamily PTEROMALINAE

Key to Genera of Micronesian Pteromalinae

1. Tergite 2 broad, one-third to one-half length of abdomen 2
   Tergite 2 not covering one-third of abdomen 3
2. Face triangular; pleura smooth and shiny ..... **Moranila**
   Face more or less rectangular; pleura deeply reticulate ..... **Eupteromalus**
3. Antennae inserted below middle of face 4
   Antennae inserted at or near middle of face 5
4. Fore wings with dark area below stigmal vein; tibiae yellow ..... **Ptinobius**
   Fore wings hyaline; tibiae metallic black ..... **Paruriella**
5. Left mandible three-dentate, right mandible four-dentate ..... **Habrocytus**
   Both mandibles four-dentate 6
6. Metanotum with median carina and with spiracular sulci 7
   Metanotum without median carina and without spiracular sulci ..... **Merisus**
7. Female abdomen ovate, shorter than head and thorax combined; male antennae without long hairs ..... **Pteromalus**
   Female abdomen conic-ovate, longer than head and thorax combined; male antennae with 12 long hairs in a ring at each nodelike swelling ..... **Norbanus**

Genus **Moranila** Cameron

Moranila Cameron, 1883, Ent. Soc. London, Trans., 188 (type: *Moranila testaceiceps* Cameron, monobasic = *Tomocera californica* Howard, not Desmarest).

Tomocera Howard, 1881, *In* Comstock, U. S. Dept. Agric., Ann. Rept. for 1880, 368 (preoccupied by *Tomocera* Desmarest, 1858).—Peck, 1963, Canadian Ent., Suppl. **30**: 631-632.

63. Moranila californica (Howard).

Tomocera californica Howard, 1881, U. S. Dept. Agric., Ann. Rept. for 1880, 252, 368.—Fullaway, 1912, Hawaiian Ent. Soc., Proc. **2**: 216, 286. —Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 212-213.—Yasumatsu and Yoshimura, 1945, Mushi **16** (7): 30.

Moranila californica Howard, 1963, Peck, Canadian Ent., Suppl. **30**: 631-632.

DISTRIBUTION: California, Mexico, Hawaii, Australia, Europe, S. Mariana Is., Caroline Is., Wake I.

S. MARIANA IS. SAIPAN: Female (US), June 1945, on *Acacia,* Townes. TINIAN: Female (US), June 1946, Oakley; female, Mt. Lamlam, Feb. 1948, Krauss. GUAM: Female, Pt. Oca, May 1945, Dybas; two females, Pt. Oca, near Agana, May 1945, Gressitt; three females, May 1945, Pt. Oca, May, June 1945, Dybas, female, pupa, Barrigada, Nov. 1952, on *Hibiscus,* Gressitt; female (US), Sumay, June 1936, Swezey; female (BISHOP), Sumay, June 1936, ex *Saissetia hemispherica,* Usinger; female (BISHOP), Santa Rosa Pt., May 1936, Usinger; seven females (US), Oct. 1936, on bamboo, Nov. 1936, Swezey.

PALAU. KOROR: Female, Jan. 1954, ex *Ceroplastes floridensis* on mango, Beardsley; four females, Apr.-July 1953, Aug. 1953, ex coconut, light trap, Beardsley; two females, Apr. 1954, ex *Ceroplastes* on *Nephrolepis* fern, Beardsley; two females, Jan. 1953, ex *Saissetia hemispherica,* Beardsley.

TRUK. DUBLON: Female (US), May 1946, Townes.

MARSHALL IS. KWAJALEIN: Female, Kwajalein I., May 4, 1958, Gressitt; female, Mar. 1953, Clagg.

WAKE. Female (US), Nov. 1959, on *Pisonia,* Ford.

This species is known to parasitize species of Asterolecaniidae, Pseudococcidae, Coccidae, Sympherobiidae, and Encyrtidae (Yasumatsu and Yoshimura, 1945; Peck, 1963).

Genus **Merisus** Walker

Merisus Walker, 1834, Ent. Mag. **2**: 166 (type: *Merisus splendidus* Walker; monobasic).—Peck, 1963, Canadian Ent., Suppl. **30**: 644-650.

64. Merisus sp.

Male: Head and thorax metallic black with bluish green luster in general. Antennae reddish brown except base of scape yellowish. Fore wings hyaline, submarginal vein pale yellowish, marginal, postmarginal, and stigmal vein dark brown. Legs pale yellowish except coxae dark brown to fuscous. Abdomen brownish, darker toward apex.

Head wider than thorax and wider than deep (28:26); face deeply reticulate, frontovertex 2.5 times as wide as head; scrobes shallow; occipital margin indistinct. Antennae long; scape elongate, subcylindrical, approximately 7 times as long as broad, pedicel stout, cone-shaped, as long as broad; one ring segment; funicle segments subequal in length, with sparse long hairs.

Pronotum narrower than mesonotum, deeply reticulate, mesonotum with complete parapsidal furrows and deeply reticulate; scutellum nearly rounded and convex dorsally, surface similar to mesonotum. Propodeum produced into a narrow neck at apex, deeply reticulate, mid dorsum saddle-shaped with slight depression at middle of lateral margin.

Fore wings uniformly ciliate except at base, partly bare; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 25: 25: 21: 23; submarginal vein with 9 bristles; marginal vein with 15 bristles.

Abdomen ovate, flattened, less than one-half length of head and thorax combined, cylindrical, as long as broad, one-half length of hind coxa and deeply reticulate. Abdominal segments smooth, segment 2 broadest and longest; four visible segments.

Length of body, 1.1 mm.

DISTRIBUTION: S. Mariana Is.

S. MARIANA IS. GUAM: Male, Piti, ex dipterous leafminer in *Morinda*, May 1963, Swezey.

Genus **Paruriella** Girault

Paruriella Girault, 1913, Roy. Soc. South Australia, Trans. Proc. **37**: 107.

65. Paruriella sp.

Male: Body metallic black with bluish-green luster in general. Antennal funicle dark; part of trochanter, tibiae, tarsi, except apical portion, dark brown. Fore wing hyaline with veins brownish.

Head wider than thorax; head and thoracic notum deeply reticulate; propodeum with less intensive reticulation than notum.

Antennal scape flattened on inner side, slightly convex, oblong, not reaching anterior ocellus. Pedicel stout, as long as broad; two ring segments; funicle segment 1 narrow and shorter than 2; following five segments subquadrate, gradually increasing in width and length distad; club 3-segmented, wider than preceding segment.

Mesoscutum with incomplete parapsidal furrows; scutellum concave and rounded at apex. Pronotum slightly narrower than mesonotum, deeply reticulate; propodeum broadly produced, with a median carina and two deep depressions at middle of lateral margins.

Fore wing ciliate except approximately basal one-third nearly bare; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 24: 26: 10: 21; seven or eight bristles on submarginal vein.

Abdomen shorter than head and thorax combined; abdomen shiny and smooth with faint reticulate pattern on surface.

Length of body, 1.2 mm.

DISTRIBUTION: Bonin Is., S. Mariana Is.

BONIN IS. CHICHI JIMA: Male, Sakai-ura, "Bull Beach," May 1958, Snyder and Mitchell.

S. MARIANA IS. GUAM: Male, Yigo, Feb. 1958, Krauss.

Genus **Eupteromalus** Kurdjumov

Eupteromalus Kurdjumov, 1913, Rev. Russe Ent. **13**: 12 (type: *Pteromalus nidulans* Thomson = *Pteromalus hemipterus* Walker, original designation).—Peck, 1963, Canadian Ent., Suppl. **30**: 683-690.

66. Eupteromalus americanus Gahan.

Eupteromalus micropterus Packard, 1928, U. S. Dept. Agric., Tech. Bull. **81**: 14.

Eupteromalus americanus Gahan, 1933, U. S. Dept. Agric., Misc. Pub. **174**: 82-86.—Peck, 1951, *In* Muesebeck et al., U. S. Dept. Agric., Agric. Monogr. **2**: 554.

DISTRIBUTION: United States, Russia, Europe, Bonin Is., S. Mariana Is.

BONIN IS. CHICHI JIMA: Two females, male, Omura, "Camp Beach," May-June 1958, Snyder and Mitchell.

S. MARIANA IS. GUAM: Female, Mt. Alifan, Apr. 1946, Krauss.

Genus **Norbanus** Walker

Norbanus Walker, 1843, Soc. Ent. France, Ann. II, **1**: 159.—Peck, 1963, Canadian Ent., Suppl. **30**: 740-741.

67. Norbanus nigriceps Yoshimoto and Ishii, n. sp. (fig. 32).

Female: Black with a moderate greenish reflection in general; antennae black except scape and pedicel dark brown, but the basal one-fourth of scape yellowish brown; tegulae yellowish brown. Wings hyaline with veins brown; legs yellowish brown except coxae black, apical part of all tibiae and tarsi pale yellowish brown, but terminal segment of tarsi yellowish brown.

Head a little wider than thorax and wider than deep (48: 35); frontovertex wide, about one-half as wide as head; post-scapal furrow very shallow; ocelli in an obtuse-angled triangle, posterior pair separated from inner eye margins by their own length; occipital margin indistinct; eyes one-half depth of head; toruli just below basal line of eyes, nearly circular and separated by one-half of their diameter; mouth edge nearly straight. Sculpture of frons, vertex, and occiput rather closely raised reticulate, but near clypeal edge longitudinally strio-reticulate. Right mandible 4-dentate with upper tooth truncate, and left distinctly 3-dentate. Eyes bare; head with sparse hairs.

Antennae 12-segmented, about 1 mm. in length; scape cylindrical, rather slender with sparse whitish hairs; pedicel nearly twice as long as wide at apex; two ring segments, ring segment 1 about one-half as long as 2; funicle 6-segmented, with sparse grayish hairs; funicle segment 1 nearly twice as long as pedicel, three times as long as wide, widest at middle, segment 2 as long as segment 1, segment 3 a little shorter than 2, segment 4 a little shorter than 3, segment 5 nearly as long as 4, segment 6 much shorter than 5, a little longer than wide; club with two segments, almost as long as preceding two funicle segments combined; funicle segment 1 much shorter than segment 2, segment 2 ending in a spinelike projection.

Thorax raised-reticulate with sparse grayish hairs; pronotum collar-like, very short, middle part shortest, anterior margin straight and marginate; parapsidal furrows distinct, but obsolete at posterior one-third; scutellum rounded at apex; axillae widely separated; mesopleura coarsely scaly reticulate with a longitudinal keel at middle set with grayish hairs; propodeum raised reticulate; metapleura scaly reticulate; spiracles oblong.

Wings 1.6 mm. long and 0.64 mm. wide; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 27: 24: 10: 27; discal ciliation moderate, not so thick except basal part just below submarginal vein bare; marginal ciliae short. Hind wing with sparse cilia except basal part bare. Legs normal; coxae scaly reticulate; hind coxae not especially large. Ovipositor scarcely produced.

Abdomen long ovate, or more or less lanceolate, considerably longer than head and thorax combined, scaly reticulate, and sparsely grayish-haired. Segments subequal in length except segment 2 which is nearly one-half as long as segment 3.

Length of body, 2.4 mm.

Male: Almost similar to female, but antennae differ very much; abdomen shorter than head and thorax combined, about as long as thorax. Antennae rather long, about 1.8 mm. in length, 13-segmented with two ring segments, ring segment 1 one-half as

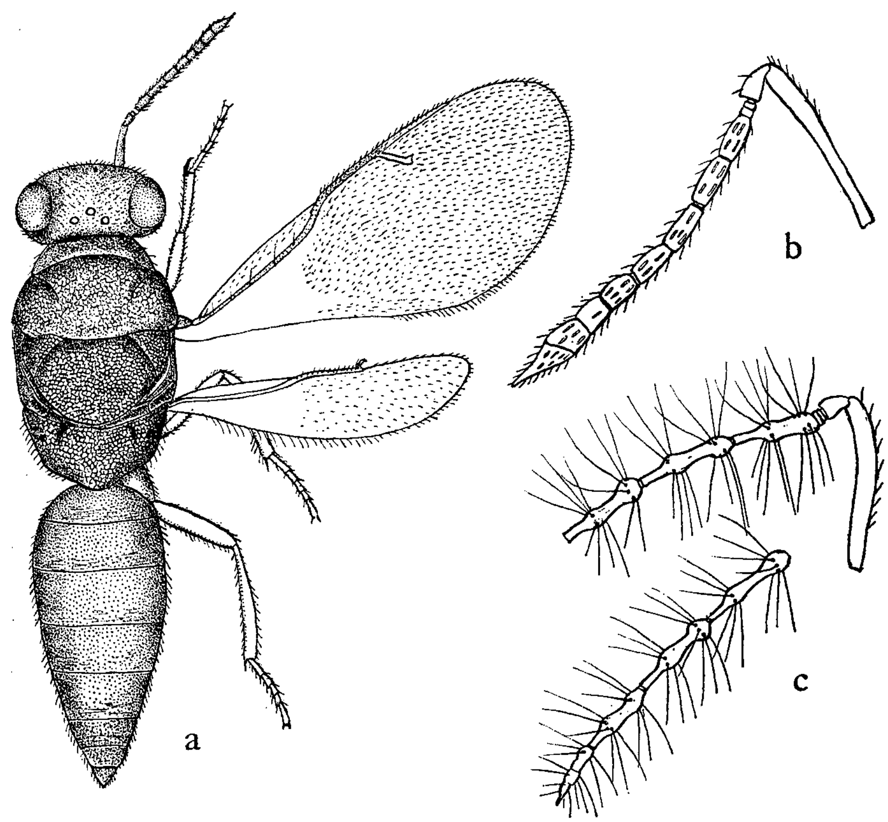


FIGURE 32.—*Norbanus nigriceps*, female: **a**, dorsal view; **b**, female antennae; **c**, male antenna.

long as 2; scape rather long; cylindrical, more or less widened at apical half; pedicel as long as wide at apex; funicle 6-segmented with segments pedunculate, all segments same in form, swollen with sparse long hairs; club 3-segmented, segment 1 a little longer than 2, and 3 pointed at tip. Abdomen with very short petiole.

Length of body, 2 mm.

Holotype, female (US 67534), Nanue I., Ponape I., June-Sept. 1950, Adams. Allotype, male (US), Yap I., Oct. 1952, Krauss. Paratypes (BISHOP, US): Male, Malakal I., Palau Is., May 2, 1957, Sabrosky; three

females, three males, Yap Group, July-Aug. 1950, Goss; female, Mt. Matade, 95 m., Yap I., Dec. 1, 1952, Krauss; two males, Yap I., Oct. 1952, Krauss; female (US), Kolonia, Yap I., at light, Mar. 1, 1949, Maehler; male, Ruul, nr. Kolonia, Yap I., June 13, 1957, Sabrosky; male, Giliman, Yap I., June 12, 1957, Sabrosky; female, Mt. Temwetemwensekir, Ponape, slope about 150-450 m., Mar. 23, 1948, Dybas; Agric. Expt. Sta., Ponape, June-Sept. 1950, Adams.

DISTRIBUTION: Caroline Is. (Palau, Yap, Ponape).

68. Norbanus elongastus Yoshimoto and Ishii, n. sp.

Female: Head and body black with a greenish reflection, but abdomen bronzy. Wings hyaline with veins pale brown. All legs reddish yellow; hind femora mostly, and tibiae in basal half, brownish; all coxae concolorous with body. Sculpture similar to that of *N. nigriceps.*

Antennae brown; fore wings uniformly ciliate except at base just below submarginal vein; cilia on anterior margin very short; submarginal, marginal, stigmal, and postmarginal veins approximately in a ratio of 50: 30: 10: 20. Abdomen much longer than head and thorax combined, and lanceolate toward apex. Abdominal segments 1 and 5 subequal in length, segment 6 twice as long as 5, segment 7 twice as long as 6, and following segments very short. Ovipositor almost hidden.

Length of body, 5 mm.

Holotype, female (BISHOP 3617), Elato I., Elato Atoll, Caroline Is., Feb. 5, 1953, Beardsley. Paratypes: Female, Koror I., Palau Is., Apr. 28, 1957; two females, Giliman, Yap I., June 12, 1957, Sabrosky.

DISTRIBUTION: Caroline Is. (Palau, Yap, Elato).

This species is closely related to the preceding species, but it may be distinguished by the long abdomen and by the longer seventh abdominal segment.

Genus **Pteromalus** Swederus

Pteromalus Swederus, 1795, K. Sven. Vet.-Akad., Handl. **16**: 201-205 (type: *Ichneumon puparum* Linnaeus; designated by Westwood, 1840).—Peck, 1963, Canadian Ent., Suppl. **30**: 712-722.

69. Pteromalus puparum (Linnaeus).

Ichneumon puparum Linnaeus, 1758, Syst. Nat., ed. 10, **1**: 567.

Pteromalus brassicae Curtis, 1829, Guide Brit. Ins. **4**: 116.

Pteromalus puparum: Walker, 1844, Ann. Mag. Nat. Hist. **14**: 16.

DISTRIBUTION: Canada, United States, Europe, N. Africa, China, New Zealand, Hawaii, Bonin Is., N. Mariana Is., Caroline Is.

BONIN IS. CHICHI JIMA: Three males, Omura, "Camp Beach," May-June 1958, Snyder, Mitchell.

YAP. YAP: Two males, Kolonia, Mar. 1954, Beardsley.

This species is a parasite of *Pieris rapae* pupae.

Genus **Habrocytus** Thomson

Habrocytus Thomson, 1878, Hym. Scand. **5**: 58, 109 (type: *Pteromalus albipennis* Walker; designated by Ashmead, 1904).—Peck, 1963, Canadian Ent., Suppl. **30**: *722-733*.

70. Habrocytus medicaginis Gahan (fig. 33).

Habrocytus medicaginis Gahan, 1915, U. S. Nat. Mus., Proc. **48**: 163-164. —Peck, 1963, Canadian Ent., Suppl. **30**: *727*.

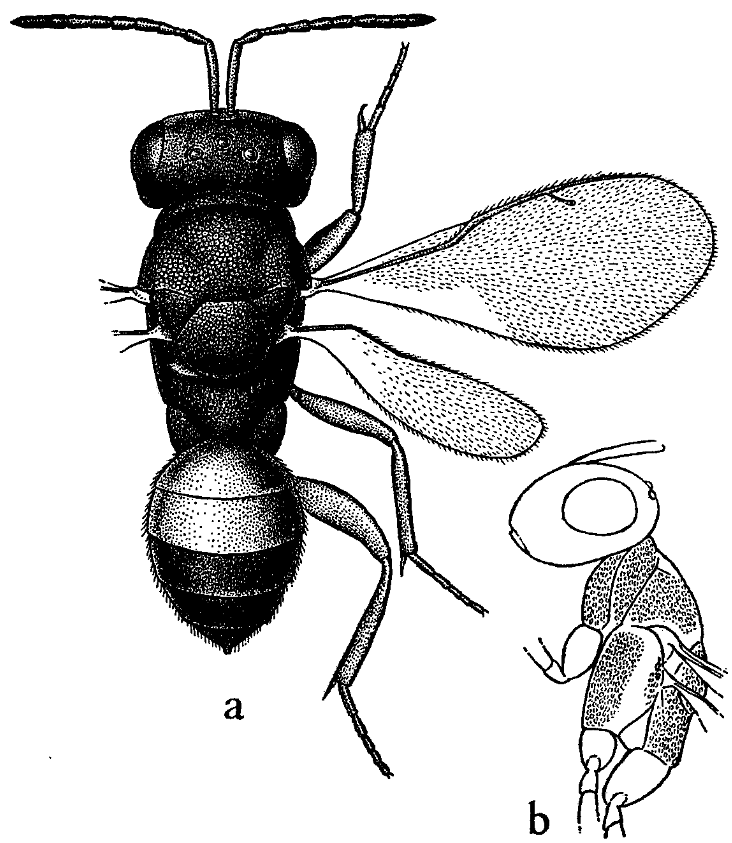


FIGURE 33.—*Habrocytus medicaginis*, female: **a**, dorsal view; **b**, lateral view.

DISTRIBUTION: S. Mariana Is., Caroline Is., mainland United States, Hawaii, Russia.

S. MARIANA IS. GUAM: Female, Mt. Alifan, Apr. 1946, Krauss.

PONAPE: Two females, Colonia, June-Sept. 1950, Adams.

This species is a parasite of the clover-seed chalcid, *Bruchophagus platyptera* (Walker), and of *B. kolobovae* Fedoseeva and *B. roddi* Gussakovskii (Peck, 1963).

Genus **Ptinobius** Ashmead

Ptinobius Ashmead, 1896, Ent. Soc. Washington, Proc. **4**: 11 (type: *Charitopus magnificus* Ashmead; monobasic).—Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 213.—Peck, 1963, Canadian Ent., Suppl. **30**: 745-747.

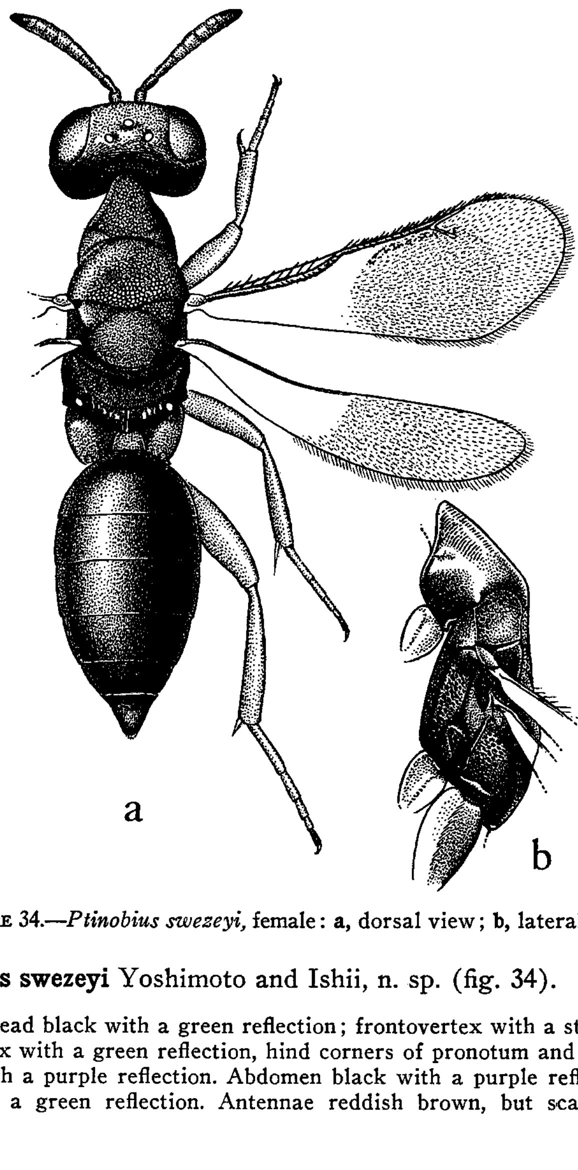


FIGURE 34.—*Ptinobius swezeyi*, female: **a**, dorsal view; **b**, lateral view.

71. Ptinobius swezeyi Yoshimoto and Ishii, n. sp. (fig. 34).

Female: Head black with a green reflection; frontovertex with a strong purple reflection. Thorax with a green reflection, hind corners of pronotum and lateral sides of propodeum with a purple reflection. Abdomen black with a purple reflection; base of segments with a green reflection. Antennae reddish brown, but scape and pedicel

brown, former having a green reflection, and terminal segment brownish. Wings hyaline with veins pale brown. Fore wings with a pale-brown band just below marginal vein. Legs reddish brown except coxae black. Hind coxae with a strong bluish reflection; terminal segment of all legs brown.

Head scaly reticulate except frontovertex smooth; pronotum and mesoscutum reticulate, but hind corners of latter smooth and shining; scutellum minutely reticulate; propodeum rugosely reticulate with middle and lateral carina, and also with a transverse carina near apex. Abdomen smooth except distal two segments scaly reticulate. Head with frontovertex rather broad; antennal scrobes very shallow; ocelli in an obtuse-angled triangle; eyes hairy.

Antennae rather short; scape considerably dilated below; pedicel nearly twice as long as wide at apex; one ring segment one-half as long as wide; funicle segment 1 rather small, as long as wide and much shorter than pedicel, funicle segment 2 slightly wider than segment 1 and as long as wide, following four segments subequal in length and width and slightly wider than segment 2; club 2-segmented, slightly wider than last funicle segment and nearly as long as preceding two segments combined, basal segment with a strong spine on inner side and as long as terminal segment. Abdomen long ovate, nearly as long as thorax; ovipositor sheaths hidden.

Length of body, 3 mm.

Holotype, female (BISHOP 3618), Piti, Guam, ex larva of *Agrilus occipitalis,* Sept. 10, 1936, Swezey. Paratypes (US): Female, Koror I., Palau, May 1953, Beardsley; female, on plane from south, intercepted at Honolulu, Oct. 25, 1949, Russell.

DISTRIBUTION: S. Mariana Is. (Guam), Caroline Is. (Palau).